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LAWS AND CUSTOMS OF WAR AT SEA AS AFFECTED BY THE WORLD WAR

BY REAR ADMIRAL RICHARD WAINWRIGHT, U. S. NAVY, RETIRED

PRIOR to the advent of the World War there was an attempt to agree upon the laws to govern maritime warfare, so as to have a body of laws for the guidance of an international prize court, recommended by the Second Hague Conference. The Declaration of London was the result. Great Britain failed to ratify the Declaration of London although it was only after some energetic protest from her naval officers that the ratification was refused. Similar protests from American naval officers failed to prevent ratification by the United States.

After war was declared the Allies agreed to accept the Declaration of London as a guide, with certain omissions and modifications. In agreement with her Allies several Orders in Council were issued by Great Britain making further modifications, and finally under date of July 7th, 1916, Great Britain by Order in Council formally withdrew all adhesion to the Declaration of London and expressed the intention, "to exercise their belligerent rights at sea in strict accordance with the law of nations." That necessity knows no law, may not with justice be strictly applied to their conduct of maritime warfare; but that necessity did require many twists and turns to the laws and customs prevailing before the World War, can hardly be denied. The Germans disregarded both laws of war and those of humanity.

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The Allies, under the claim of necessity, seriously encroached on the rights of neutrals.

The laws of war at sea have gradually led to the restriction of neutral maritime rights. The list of contraband articles, commencing at munitions of war, has gradually increased until (as extended during the World War) it includes nearly every article of commerce. Conditional contraband, which was recognized by the Declaration of London and was immune from the doctrine of continuous voyage, was denied this right by the Allies.

The restriction of neutral rights by the law of continuous voyage was largely extended by the Union courts during our Civil War. If the ultimate destination was enemy country the capture was justified; but during the World War, although the goods might be destined to form part of the common stock of the neutral, the capture of a belligerent was allowed if the receiving neutral exported such goods to a rival belligerent; and the penalty attached to the neutral goods, although they were proved to be innocent of enemy destination.

The right of search was definitely determined by the custom of maritime nations prior to the World War, to be the right of search of ships, papers, and cargo at sea, and care was exercised to make the delay to innocent neutral commerce the minimum possible; and redress was given by belligerent courts where vessels or goods were captured without probable cause. During the World War the right of search was extended to include the right of detention. Neutral vessels were taken into belligerent ports for search. Some were released in a few days, without compensation for delay; some had all or a portion of their cargoes discharged. Some were required to pay port dues, unloading charges, etc., and to sign releases of all claims for damages due to delay. Some were held for months, to obtain further evidence, and some to force embargo orders from the neutral government of the port of destination.

The procedure of our prize courts was adopted largely from that of the British. One most equitable rule of the courts was in the first instance to examine the papers, etc., of the vessel seized, and if probable cause was not found, the vessel or goods were released at once, thus saving the costs of long trial and reducing the time of the interruption of neutral trade. The World

War changed the procedure of British courts, and the whole question was opened in the trial. Also the burden of proof was placed on the neutral, in many cases, thus increasing the delay and costs at the expense of the neutral.

The question of blockade both against military and commercial ports also had been fairly well settled. There were some differences between our practice and that of the continental powers. The Declaration of London made the requirements of notice, etc., rather severe for belligerents; but there was no doubt about the right to blockade neutral ports,—that was prohibited. Yet during the World War the right of the Allies to detain all commerce on its way to or from enemy countries, by a direct route or through neutral countries, was proclaimed. In this no distinction between contraband and innocent goods was made, and it was claimed that all goods afloat that might in any manner reach the enemy were lawful prize. Neutral ships and neutral goods were safe within neutral ports, and within the three-mile limit of neutral coasts; in the open sea, they were liable to be seized by the belligerents.

CONTRABAND

The list of contraband of war has been steadily enlarging. In the Fourth Commission of the Second Hague Conference, Great Britain proposed to abolish contraband entirely. Among others this was opposed by the United States and France. In a sub-committee an agreement was finally reached as to absolute contraband; but our technical delegate refused to consider the question of conditional contraband. In the conference the matter of contraband was postponed for further consideration. In 1904 our Secretary of State, John Hay, writes to the American Ambassador at St. Petersburg (Dept. of State No. 143):

> Articles which, like arms and ammunition, are by their nature of self-evident warlike use are contraband of war if destined to enemy territory; but articles which, like coal, cotton and provision, though ordinarily innocent, are capable of warlike use, are not subject to capture and confiscation unless shown by evidence to be actually destined for the military or naval forces of a belligerent.
>
> The established principle of discrimination between contraband and non-contraband goods admits of no relaxation or refinement. It must be inflexibly adhered to or abandoned by all nations. There is and can be no

middle ground. The criterion of warlike usefulness and destination has been adopted by the common consent of civilized nations after centuries of struggle in which each belligerent made indiscriminate warfare upon all commerce of all neutral States with the people of the other belligerent, and which led to reprisals as the mildest available remedy.

In the Declaration of London is a list of absolute contraband articles, one of conditional contraband, and one of articles not to be declared contraband. On this latter list will be found raw cotton and rubber. Food is in the conditional contraband list.

Conditional contraband is liable to capture if it is shown that it is destined for the use of the armed forces or of a government department of the enemy State . . . . (Article 33).

The doctrine of continuous voyage is excluded from conditional contraband.

The ship's papers are complete proof of the voyage of a vessel transporting absolute contraband, unless the vessel is encountered having deviated from the route which she ought to follow according to the ship's papers and being unable to justify by sufficient reason such deviation. (Article 32)

The World War was prosecuted with such intensity that the efforts of all the inhabitants of the belligerent nations were concentrated upon running the war; making food products takes a most important place in the conduct of the war. Also many new instruments of war, and the extension of the use of older instruments, made many articles on the conditional and prohibitive list, of great importance to the belligerents; and the improvement in methods of transportation made delivery in any portion of a belligerent's territory equivalent to a delivery to his military forces. It soon became evident to the allied countries that it was important to their interests that the list of absolute contraband be extended. This was done gradually, first by extending the doctrine of continuous voyage to the conditional contraband list, and then by adding articles that under the Declaration of London were not to be declared contraband. Finally it was announced that the Declaration of London would no longer bind the belligerents and virtually all trade with the enemy became contraband; and, through the application of the doctrine of continuous voyage, all neutral trade with the enemy was stopped, and all our trade with neutrals, such as the Scandinavian countries

and Italy (while still a neutral), was interrupted. While not deliberately announced as a blockade by the Allies, there was virtually a military blockade, and a very efficient one, against all enemy country, and a pacific blockade against the neutrals above mentioned. The course of our foreign trade was entirely directed by Great Britain, with some little assistance from France. The following shows the very broad view of the right of belligerents as to blockades, held by the British Government.

> The measures taken by the Allies are aimed at preventing commodities of any kind from reaching or leaving German ports.
>
> Due notice has been given by the Allies of the measures they have taken, and goods which were shipped or contracted for before the announcement of the intention of the Allies to detain all commerce on its way to or from the enemy countries have been treated with great liberality. The objects with which the usual declaration and notification of blockade are issued have therefore been fully achieved.

Contrast these statements with Hay's instructions to our Ambassador at St. Petersburg, quoted above,

> The established principle of discrimination between contraband goods admits of no relaxation or refinement.

The British Government held that the conditions of the World War made it lawful to take measures that were aimed at preventing commodities of any kind from reaching or leaving Germany. Remembering that this meant through neutral countries as well as directly to Germany, it will be seen that all trading with the enemy, directly or indirectly, became contraband.

THE RIGHT OF VISIT AND SEARCH

In 1799 Sir William Scott announced, "that the right of visiting and searching merchant ships upon the high seas, whatever be the ships, whatever be the cargoes, whatever be the destination, is an incontestable right of the lawfully commissioned cruisers of a belligerent nation." During our Civil War Gideon Welles, Secretary of the Navy, issued very complete instructions on this subject to all flag officers. In the third paragraph he says,

> That when that visit is made the vessel is not then to be seized without a search carefully made so far as to render it reasonable to believe that she is engaged in carrying contraband of war for or to the insur-

gents and to their ports directly or indirectly by transhipment, or otherwise violating the blockades.

The regulations relating to capture at sea, issued by the Japanese in 1904, contained the following article:

In visiting or searching a vessel the captain of the man-of-war shall take care not to divert her from her original course more than necessary and as far as possible not to give her inconvenience.

The following articles were in the British Regulations:

Visit, search, and detention must be exercised in accordance with the established course of procedure.

When a vessel has been detained she should be sent, with the accustomed precautions, to a Port of Adjudication; and upon her arrival there proceedings should be commenced with a view to her being duly condemned by a Prize Court.

If a Commander in the exercise of these powers detain a vessel without probable cause, or do an act not sanctioned by international law, or otherwise unwarrantable, he will incur the displeasure of Her Majesty's Government, and will also be personally liable for damages.

The Declaration of London, Article 64, is as follows:

If the capture of a vessel or of goods is not upheld by the prize court or if without being brought to judgment the prize is released, the parties interested have the right to compensation, unless there were sufficient reasons for capturing the vessel or goods.

The World War caused an expansion of the right of visit and search to one of detention for the purposes of search. The British claim was that it was impossible to conduct a real search at sea under modern conditions, and in this claim were supported by their naval officers, who as experts were called upon for their opinion. Our experts claimed that there was not sufficient change in conditions since the old rule was established to justify a change in procedure. There is no doubt that it is impracticable thoroughly to search a modern vessel at sea. This has been true for many years, and it is an undoubted fact that valuable contraband could be readily concealed so that it would be discovered only after discharging cargo and a thorough search. Neutral vessels were taken into Kirkwall and other ports convenient for the belligerents, and there examined. At first the detention of neutral vessels in belligerent ports was for the search of cargo and papers; but as the contraband list was extended,

many vessels were so detained, when they were well known to hold contraband, and to be destined to neutral ports. There was no necessity for search, and no prize proceedings were attempted. Examples of this will be given in the discussion of the rule of continuous voyage. The only complete answer to the objections raised by the authorities of the United States, to these acts made by the British Government, is in the phrase already quoted, "The measures taken by the Allies are aimed at preventing commodities of any kind from reaching or leaving Germany. . . . "

CONTINUOUS VOYAGE

The doctrine of "continuous voyage" was extended during our Civil War under the same pressure of necessity, and the same reliance on the fundamental rights of belligerents, as actuated the Allies during the World War. It was decided by our courts that the final destination of the contraband was the deciding point and that condemnation was justified, if it was intended to complete the voyage to an enemy port by transhipment in a neutral port to another vessel, as in the *Bermuda* case, or to an enemy country by rail or other land transportation, as in the *Peterhoff* case. The deciding point at this time was the question, were the goods destined for the "common stock" of the neutral or were they intended for the enemy?

In the case of the *Stephen Hart,* Judge Betts said:

> If she was in fact a neutral vessel and if her cargo, although contraband of war, was being carried from an English port to Cardenas for the general purpose of trade and commerce at Cardenas, and for use or sale at Cardenas, without any actual destination of the cargo, prior to the time of capture, to the use and aid of the enemy, then most certainly both the vessel and her cargo were free from liability of capture.

In the *Bermuda* case the Supreme Court said:

> We agree to this. Neutrals might convey in neutral ships, from one neutral port to another, any goods, whether contraband of war or not, if intended for actual delivery at the port of destination and to become part of the common stock of the country or of the port.

In the case of the *Peterhoff* the Supreme Court said:

> It is true that even these goods if really intended for sale in the market of Matamoras, would be free from liability; for contraband may be trans-

ported by neutrals to a neutral port, if intended to make part of its general stock in trade. But there is nothing in the case which tends to convince us that such was their real destination, while all the circumstances indicate that these articles, at least, were destined for the use of the rebel forces then occupying Brownsville, and other places in the vicinity.

Under former rules of war the vessel and cargo would be liable to capture when bound directly for the blockaded port but under our Civil War decisions the vessel and cargo were liable to capture if the ultimate destination was to a blockaded port or to enemy forces. Of course these decisions were severely criticized after our Civil War. Walker says:

> This decision, it is very evident, materially extends the risks of the neutral trader in the interests of the belligerent.

And Hall says:

> The American decisions have been universally reprobated outside the United States, and would probably now find no defenders in their own country.

Sir Robert Phillimore says:

> It seems to me after much consideration, difficult to support the decision of the majority of the Supreme Court of the United States in the case of the *Springbok*, that a cargo shipped for a neutral port can be condemned on the ground that it was intended to tranship it at that port and forward it by another vessel to a blockaded port.

The British Admiralty Manual of Naval Prize Law, 1888, shows a partial acceptance of our Civil War doctrine.

> The ostensible destination of the vessel is sometimes a neutral port, while she is in reality intended, after touching and even colorably delivering over her cargo there, to proceed with the same cargo to an enemy port. In such a case the voyage is held to be "continuous" and the destination is held to be hostile throughout.
>
> On the other hand, if the destination of the vessel be neutral, then the destination of the goods on board should be considered neutral, notwithstanding it may appear from the papers or otherwise that the goods themselves have an ulterior hostile destination, to be attained by transhipment, overland conveyance, or otherwise.

In 1900, during the Boer War, the German Ambassador at London declared it to be the opinion of his Government that prize proceedings in the case of the *Bundersrath* were not justified, for the reason that, no matter what may have been on

board, "there could have been no contraband of war, since, according to recognized principles of international law, there cannot be contraband of war in trade between neutral points."

Lord Salisbury replied that the rules heretofore adopted were "quite inapplicable to the case which has now arisen of war with an inland state, whose only communication with the sea is over a few miles of railway to a neutral port." He also quoted Bluntschli as sustaining his view of the case:

> If the ships or goods are sent to the destination of a neutral port only the better to come to the aid of the enemy, there will be contraband of war and confiscation will be justified.

Up to the time of the World War it seems to have been the accepted doctrine in Great Britain and the United States that goods shipped from one neutral port to another and intended for the "general stock" of the receiving neutral were not liable to confiscation. International law authorities of Continental Europe never accepted these extensions of the doctrine of "continuous voyage," but in the Declaration of London it was accepted for absolute contraband.

> Article 30. Absolute contraband is liable to capture if it is shown to be destined to the territory belonging to or occupied by the enemy or to the armed forces of the enemy. It is immaterial whether the carriage of the goods is direct or entails either transhipment (Case of *Bermuda*) or transport overland. (Case of *Peterhoff*.)

Under the Declaration of London the doctrine of "continuous voyage" did not hold in the case of conditional contraband.

However, this doctrine was further extended as will be shown in the following quotations:

> The steamer *Seguranca*, which carried a general cargo from New York to the Netherlands, was detained at a great loss to the owners of the vessel and to the shippers in a British port for the greater part of last April (1915) in order that her cargo might be reconsigned to the Netherlands Oversea Trust.

In this case vessel and goods were held, although the goods were intended for the "general stock" until they were secured from leaving the Netherlands and being transported to Germany.

> The steamers *Christian Knudsen* and *Platura*, carrying oil from New York to Denmark, were detained by the British authorities last fall, taken into British ports, and held until the British Government, as they

stated, could make an investigation as to the destination of the cargo. Furthermore, this Government was informed that the vessels had been detained pending the receipt of guarantees from Denmark against the exportation of the cargoes, and that the orders were given for the release of the vessel on the receipt of satisfactory guarantees.

Here the cargo was held, not because of evidence of enemy destination was found on the vessel, but to await a further search for evidence; and also because Denmark's need for oil would force her to guarantee against re-exportation.

The British authorities have repeatedly seized articles classified as contraband, articles classified as conditional contraband, as well as noncontraband goods, shipped to Scandinavian countries, to the Netherlands, and to Italy, then neutral, although the re-exportation of such commodities from these countries had been forbidden.

In December last the steamer *Tellus* was ordered to discharge a shipment of copper shipped from New York directly to a consignee in Milano, Italy, although by an Italian decree of November 13, 1914, the exportation of goods shipped in this manner was forbidden.

The steamer *Leelanaw,* which carried a cargo of cotton from Galveston to Gothenburg for transhipment to Moscow, was detained in a British port early in June last. Relative to the detention of this vessel the British Foreign Office said: "In view of the fact that cotton has now been placed on the Swedish prohibition of export list His Majesty's Government have not considered it advisable to allow this large cargo to go on to Gothenburg until they are assured that there is a fair chance of it reaching its declared ultimate destination." After nearly a month's detention the vessel was released on the understanding that she should proceed directly to Archangel.

In the cases of the Tellus and Leelanaw, although the ultimate destination was evidently not the enemy, the goods were held for fear they might in some way aid the enemy. The vessels and goods were not brought into court for condemnation and the owners were thus deprived of the usual means of obtaining damages. See also the following case:

The steamer *Wico* was held by the British authorities last March (1915). This Government was advised that the British Minister at Stockholm has informed the Swedish Foreign Office that the vessel had arrived in a British port with a full cargo of oil for a concern in Stockholm, and that, in view of the recent seizure by a German man-of-war of the steamship *Bryssel* and her cargo, the British Government required complete assurances from the Swedish Government, before the *Wico* could be allowed to proceed to destination, that she would not share the fate of the *Bryssel.*

Our frequent protests to these apparent irregularities in restraint of our right of trade as a neutral received the following reply:

> It would seem to be a fair reply to such a contention that new devices for despatching goods to the enemy must be met by new methods of applying the fundamental and acknowledged principle of the right to intercept such trade.

BLOCKADES

The rules for the establishment and conduct of blockades were fairly well established when the London Conference was called. Paper blockades, such as were established by the Berlin Decree of Napoleon and Great Britain's Orders in Council were considered illegal, and it was held that military blockades must be efficient. Pacific blockades were generally recognized. The London Declaration adopted some rules that were rather stringent for the belligerent, and the blockade of neutral territory was declared illegal.

When the World War opened it was generally recognized that the use of submarines made a close blockade impossible. The geographical position of Great Britain and France made the seizure of all vessels bound directly for enemy ports an easy task, except those sailing from Scandinavian ports through the Baltic. Seizure without condemnation was frequently practiced and neutral cargoes were bought by Great Britain, in many cases, notably cotton, and the vessels released. Eventually all neutral trade with Europe was controlled by the Allies and the passage of goods to and from Germany became virtually impossible. Notice was given by the Allies of the intention "to detain all commerce on its way, to or from the enemy countries. . . . "

IMMUNITY OF PRIVATE PROPERTY AT SEA

Immunity of private property at sea was suggested by Benjamin Franklin. It was again introduced by Mr. Marcy at the Paris Conference as an offset to the abolition of privateering. Our commerce was large, and our naval force negligible at this time; and the use of privateers was our only chance of reprisal should our commerce be abused. So unless private property became immune, we would continue to use privateers. The discussions

on this subject at the Hague Conferences were limited and academic. Before the Second Hague Conference, Admiral Mahan protested against the advocacy of this doctrine by Americans, and showed the lack of analogy between the so-called immunity of private property on land and at sea. Of course contraband has always been excepted from this immunity, as advocated; and with the great extension of contraband articles, such immunity becomes valueless.

REMOVAL OF PASSENGERS FROM NEUTRAL VESSELS BY BELLIGERENTS

During our Civil War Commodore Wilkes removed Slidell and Mason, in the diplomacy Service of the Confederacy, from the British mail steamer *Trent,* bound to England. Before this case, it had generally been held that only military persons were liable to capture, and that the vessel was liable to condemnation if bound to a belligerent port. The British authorities made a peremptory demand for the release of Slidell and Mason, and our Government finally complied with this demand; as they were not military persons, and their destination was a neutral port.

It must be admitted that two diplomatic officials may be more injurious to the capturing belligerent than a number of military persons. The *Trent* being a mail steamer, to have seized her and brought her into port would have caused considerable loss and inconvenience, so she was released by Wilkes. At the time authorities on international law seem to have condemned Wilkes for not bringing the vessel in for judicial examination. It is difficult at this time to see on what grounds such an opinion was formed. The *Trent* was proceeding on her regular mail trip from one neutral port to another. The two diplomats were taken on board as passengers, and their position in the service of the Confederacy was a matter of general knowledge. The whole question was as to the liability of diplomats to seizure. The British Government indignantly protested in the negative. Our Government reluctantly yielded under severe pressure.

Article 47 of the Declaration of London says:

> Any individual embodied in the armed force of the enemy, and who is found on board a neutral merchant vessel, may be made a prisoner of war, even though there be no ground for the capture of the vessel.

Here the necessity of bringing the vessel in for judicial examination is abandoned; but the rule avoids the mention of persons other than military.

In the World War the right of seizure of passengers from neutral vessels was expanded beyond that previously accepted. In the case of the *China:*

> Mr. Lansing informs Mr. Page that the Department is advised by American Consuls in Hong Kong, Nagasaki, and Shanghai, and by the owners of the American steamship *China,* that on the eighteenth instant the British Cruiser *Laurentic* stopped the *China* on the high seas, about ten miles from the entrance of the Yangtze Kiang, boarded her with an armed party, and despite the Captain's protest, removed from the vessel twenty-eight Germans, eight Austrians, and two Turks, including physicians and merchants, and took them to Hong Kong, where they are detained as prisoners in the military barracks. As it is understood that none of the men taken from the *China* were incorporated in the armed forces of the enemies of Great Britain, the action of the *Laurentic* must be regarded by this Government as an unwarranted invasion of the sovereignty of American vessels on the high seas. After the notice given to the British Government of this Government's attitude in the *Pepenbrink* case in March last, which was based upon the principle contended for by Earl Russell in the *Trent* case, this Government is surprised at this exercise of belligerent power on the high seas far removed from the zone of hostile operations. Ambassador Page is directed to present this matter to the Government of Great Britain at once, and insist vigorously that if facts are as reported, orders be given for the immediate release of the persons taken from the *China.*

The substance of the reply to this demand was:

> I do not think it will be disputed that persons of this description must be placed within the category of individuals who may, without any infraction of the sovereignty of a neutral state be removed from a neutral vessel on the high seas. The object of their journey was to find another neutral asylum in which they might continue their operations against the interests of this country.

As in the *Trent,* here we have a neutral mail steamer proceeding from one port to another. The destination of the passengers was a neutral port, and the persons removed were not in the diplomatic service, but it was alleged that they were conspirators against the interests of the British. In this case the demand for release was refused and at this late date Commodore Wilkes was more than vindicated by the British Government.

In considering the acts of the Allies, the great difference between the World War and previous wars must be remembered: the extent of Europe covered by the war; the number of troops engaged and the vast amount of machinery used by the armies; the improvement in war machines and the introduction of new implements of war; the larger percentage of the male population included in the armies; the great numbers of the people, both male and female, devoted to the manufacture of war material; and the increased facilities for transportation in most European countries. Chief Justice Chase says:

> Trade with a neutral port in immediate proximity to the territory of one belligerent, is certainly very inconvenient to the other. Such trade, with unrestricted inland commerce between such a port and the enemy's territory impairs undoubtedly, and very seriously, the value of a blockade of the enemy's coast. But in cases such as that now in judgment, we administer the public law of nations and are not at liberty to inquire what is for the particular advantage or disadvantage of our own or another country. We must follow the lights of reason and the lessons of the masters of international jurisprudence.

Chief Justice Chase in this case decided that the articles in question were contraband, and were destined for the enemy and were thus subject to condemnation. In the World War Holland afforded an example of the "inconvenient" neutral country. Lord Stowell says:

> All law is resolvable into general principles: The cases which may arise under new combinations of circumstances, leading to an extended application of principles, ancient and recognized, by just corollaries, may be infinite; but so long as the continuity of the original and established principles is preserved pure and unbroken, the practice is not *new*, nor is it justly chargeable with being *an innovation* on the ancient law, when, in fact, the court does nothing more than apply old principles to new circumstances.

There can be no doubt that "the ancient law" requires that there shall be no interference with or aid given by neutrals to belligerents and that belligerents have the right to prevent such aid or interference. There may be differences of opinion as to the justice of the acts of the Allies in interrupting our commerce, but no good American could wish that the results should have been otherwise or desire that any aid or comfort should have reached the Germans from our people.

In spite of the limited amount of information that the hand of Creel permitted to reach us, there was, undoubtedly, much feeling against the British authorities for, what seemed to us, their arbitrary acts. How important our Ambassador to the Court of St. James regarded this danger is shown in the account of his handling of the *Dacia* matter.

It would seem important that some agreement should be reached with the principal naval powers as to the laws of war at sea to govern in the future. The rejection of the Declaration of London throws us back to the laws and customs governing prior to the World War, with the additional decisions of the belligerent courts. From these may be drawn rules that, while not affecting the rights of the belligerents, may at the same time lessen the burden placed on neutrals; remembering that any hindrance to the execution of belligerent rights tends to lengthen wars, and any increase of friction with neutrals in the execution of these rights tends to draw them in, and so increase the area of the war.

The right of search, as extended during the late war into a right of detention at belligerent ports to facilitate the search for contraband, was a most serious injury to the legitimate trade of the neutrals, and cause of great friction. Even when the detention was short the removal of the ship's papers for examination by a central authority was felt unnecessary, and as possibly affording an unfair advantage to the belligerent merchants. At one time the ships were required to pay pilotage and port dues, cost of unloading and restowing the cargoes, to facilitate a search, and prior to release to sign a quit claim for all damages incident to the detention. Upon protest by our Government, this injustice was stopped. If all merchandise intended for the enemy were declared contraband, this would remove all justification for detention. Destination of the vessel and the goods would be the only question, and this could be answered by an examination of the ship's papers, and her position at the time of examination.

There can be no question but that the experience of the World War shows the necessity of greatly extending the list of contraband to preserve belligerent rights, and the greater danger of creating a list of goods not to be declared contraband, as was done in the Declaration of London. So extended has the contraband list become that it would work little injury to the

neutral to extend it to all merchandise; and this injury would be more than offset, if such extension obviated the necessity of detention in harbor and an extensive search.

It would be difficult to argue against the extension of the doctrine of continuous voyage, as was decided upon by Great Britain and France, with consistency, in view of our extension of the doctrine in our Civil War; and it may be well, for both neutrals and belligerents, if the practices adopted in the World War be acknowledged as lawful; and neutral blockades to force embargo decrees, or the creation of oversea trusts, or both, be accepted as legal. It certainly would be difficult to refuse the right of declaring a blockade of neutral coasts, in view of the many accepted cases of "pacific blockade." This was one of the unfortunate limitations of belligerent rights in the Declaration of London.

When a belligerent finds that the position of a neutral nation is such as to permit unrestricted commerce with the belligerent's enemy, he may demand that the neutral shall declare an embargo against the export of such goods to the enemy, or shall create some such corporation as "the overseas trust"; and he may enforce this demand by a "pacific blockade." Some such rule would serve to settle the course of neutral trade in a regular manner, and relieve it from much annoyance and loss, and should more than compensate for the loss of such trade as might have been carried on with the belligerent. Such rules would obviate many causes of friction that have arisen between neutrals and belligerents, and would be easy of application where, as in the World War, the naval forces of one side were so powerful as to make it necessary to deal only with the belligerents with the superior force. Where the naval forces were more equally balanced, the difficulties of the neutrals would be greatly increased.

It might be suggested that it would be a good rule to make all trade with an enemy unneutral, and require each neutral to put a stop to such trade. Such a rule would be contrary to our former sea laws, under which the neutrals could supply a belligerent with any merchandise unless forcibly prevented by another belligerent. It would not be in accordance with the best interests of humanity, as it would tend to lengthen wars by removing a portion of the value of superior force, in that the belligerent with a superior

force would receive no greater trade from neutrals than the one with the weaker force. Besides it might tend to draw neutrals into the war. Self-interest should prevent any nation with a strong sea force from agreeing to such a rule. In the World War such a rule would have worked greatly to the disadvantage of Great Britain and her Allies, and would have caused an enormous loss to all neutrals; and it would have been impossible for any administration to keep the people of the United States out of the war if England were starving for want of food supplies. Our earlier entry into the war would have been an advantage in this particular case; but in general it would seem that the fewer countries drawn into a war, the better for humanity.

The difficulties to be met in revising the laws of war at sea are shown in the efforts of the convention that produced the Declaration of London. The differences between the theories on which these laws are founded, adopted by Great Britain and ourselves, and those adopted by Continental Europe, are fundamental; but it would seem possible for us, with Great Britain and her Allies in the late war, to come to some agreement on the extension of the old laws which, while decreasing the rights and increasing the obligations of neutrals will, when in working order, do little injury to neutral trade, as the neutrals will gain in regularity what they lose in volume of trade.

Paper blockades are obnoxious. Close blockades are seldom possible, but to be legal a blockade must be effective. The amount of effort and force necessary to meet this requirement will be a source of frequent argument in the future as it has been in the past. Certainly Great Britain's blockade in the World War was effective. In its enforcement, time should be given for full knowledge by neutrals. The penalties for violating a "neutral blockade" may be made more lenient than those for violating the blockade of an enemy.

Certainly great difficulty will be encountered in drawing up a set of laws that will meet with the approval of the principal maritime nations, with their conflicting rights and interests, and however carefully drawn, much must be left to be settled by diplomacy during and after war; for a too rigid set of rules is likely to result in the rejection of all rules during a strenuous war. But it should be possible to obtain a rule against seizure without

early trial and damages, unless probable cause was found by the Court. It might be possible to revert to the preliminary examinations by the courts, as in the former practice of Great Britain and the United States. And some rule should be adopted as to what class of belligerents can be removed from a neutral vessel by another belligerent.

The decisions of an international court may be useful to determine cases after a war, and be of value to the nations involved; but they can hardly be delivered in time for the relief of the merchant. The civilization of the most advanced nations must undergo much improvement, before the jurist can replace the diplomat, and allow the judicial determination of all international disputes to prevail.

THE END OF THE TRAIL

By Lieutenant N. C. Gillette, U. S. Navy

"I'D GIVE a thousand dollars to be on the *Iowa* during that firing tomorrow," remarked one of the reporters who was in Panama to cover the event.

"You'd give another thousand to be off after that salvo," remarked one of his hearers the following day when the *Mississippi* had found the range and began dropping M. P. I.'s all over the doomed warrior.

Eventually a complete report of the Ex-*Iowa* firing will be published to the service. This will include the interesting though rather dry data as to hits, dispersion, and all the other necessary items of a complete report. In the meantime it will probably be of interest to know what general impressions were registered on the spectators as they watched the destruction of this old ship that has for years held an affectionate place in the hearts of the service.

The first exercise was a five-inch firing. This was very interesting but proved to be only mildly exciting when compared to the fourteen-inch firing. The salvos got on very quickly and a fairly large percentage of hits were made. A number of hits were scored in each of several salvos which indicated a very good pattern. These shell functioned well on impact and bright yellow points of light indicated when the shell hit and burst. The smoke would clear away quickly, however, and the general effect was much like the efforts of a small boy throwing Fourth-of-July torpedoes against a brick wall.

The next exercise was with a limited number of fourteen-inch shell of a special type. Due to the small number of shell fired only a few hits were made and no extensive damage was done.

So far the radio control and the power plant had functioned in an efficient and uncanny manner. It was something new to see a ship churning along with a bone in her teeth and smoke belching

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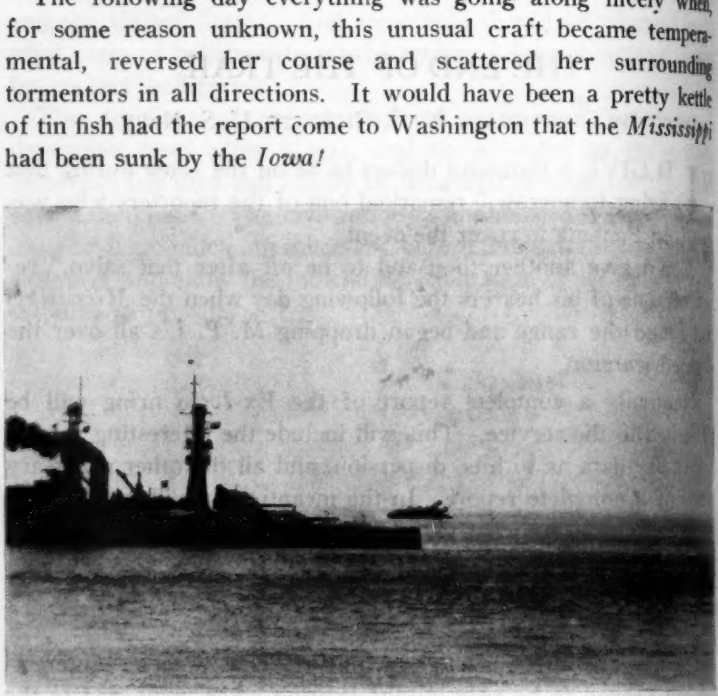
from her boilers and to realize that no one was on board—not even the reporter with the thousand dollars.

The following day everything was going along nicely when, for some reason unknown, this unusual craft became temperamental, reversed her course and scattered her surrounding tormentors in all directions. It would have been a pretty kettle of tin fish had the report come to Washington that the *Mississippi* had been sunk by the *Iowa!*



SHE SANK WITHIN TWO MINUTES AFTER THIS PICTURE WAS TAKEN
U. S. S. *Arizona* in the Foreground

A tug was soon alongside, however, and the trouble shooters scrambled abroad. They succeeded in convincing the honorable old hulk that resistance was useless and she was soon on her way again. But before the next firing started, she stopped and the smoke gradually faded from her stack.

The next phase was a repetition of the fourteen-inch firing of the previous day except that a greater number of projectiles were fired. The first day's firing had been directed against her starboard side. This firing was at her port side. During this "battle" hit after hit was scored. Towering columns of water fell upon her. Heavy clouds of smoke hung about as shell after shell burst on her decks or within her compartments. Huge chunks of steel flew

high in the air. A continual rain of small fragments splashed about her. One salvo threw tons of water on her forecastle that drained off in a cataract as she took a slight list to port. One shell crumpled the bridge. Another uprooted the towering forward smoke pipe and laid it down nicely across the forward starboard eight-inch turret. The cage mast was riddled through and through but remained steady to the last though practically all the elements had been cut before the end of bombardment. Then the firing ceased, the smoke cleared away and we steamed close by to observe the havoc as she floated serenely on the placid bosom of the Pacific.

She had an appreciable list to port. Large black gaping holes dotted her side. Smaller holes made by flying fragments were everywhere. Daylight could be seen through her bow in several places. Smoke was again belching from her after stack. This may have been from an oil fire below decks. The inspection party went aboard for a few minutes but were soon recalled and the *Mississippi* squared away for the final attack.

Now the starboard side was exposed to the fire. The shell used in this, the final stage, was armor piercing. Now we were to see some real execution. Again the thunderous concussions and reverberations were heard as the relentless salvos struck the sturdy craft. But now they pierced her through and through, bursting with terrific force from stem to stern, above and below the water line. Livid red blotches were seen for a moment as each shell burst. Now and then a beautiful canary yellow cloud intermingled with the black clouds of smoke. Again huge fountains of green water fell in torrents upon her. What of the reporter and his thousand dollars now?

She was still listing to port, but now she proudly righted herself only to list to starboard a few minutes later. Her bow, slowly, almost imperceptibly, sank until her forecastle was awash. Her quarterdeck, the scene of many honors in peace and war, still proudly maintained its dignity. More and more she listed. The firing ceased. The foretopmast toppled and sank below the water. Slowly, quietly, she rolled to starboard. Her towering cage mast slipped into the water. For a moment her port side protruded from the water like a whale basking on the surface. Then with numerous boiling, bubbling inverted bowls to mark the

escape of air, the veteran of two wars silently disappeared. Seaplanes circled and dipped above the spot like huge birds cheated of their prey.

"Attention!" Every man on the surrounding ships stood quietly at attention. A twenty-one gun salute was fired by the flagship that bore the Secretary of the Navy. A feeling of quiet sadness pervaded the fleet that steamed slowly away in the soft tropical twilight toward the anchorage.

THE PROPOSED AMALGAMATION BILL

By Commander C. W. Fisher (CC), U. S. Navy

ON MARCH 7, 1923, a proposed Amalgamation Bill was prepared by the Navy Department. The following memorandum or explanation accompanied the bill:

First, it was assumed that the amalgamation should take place along the lines of the amalgamation in 1899 of the former engineer corps with the line.

Second, the following conditions were thought to be those toward whose accomplishment efforts should be made: viz.,

(a) No increase in cost to the Naval Appropriation.
(b) No loss of rank or possibilities of promotion by any officer concerned.
(c) No advance in rank out of the ordinary for any officer concerned.
(d) Abolition, as far as possible, of temporary officers.
(e) Setting a definite date above which officers would continue to perform their present corps duties until separated from the active service by death, retirement, resignation, etc.
(f) Setting a date below which all officers would be required (probably) to qualify for combination duties.
(g) Insuring that Chiefs of Bureau in the Bureaus of Construction and Repair, Supplies and Accounts, and Yards and Docks should be taken from officers now in the construction corps, supply corps, and civil engineering corps, respectively, until the time when practically all officers now concerned would go off the active list.

The difficulties encountered in attempting to formulate appropriate rules are somewhat extensive. The question as to how to handle the amalgamation, whether by date of commission, whether by date of precedence, or some other method or combination is influenced by the fact that officers in these corps at present have no age in grade retirement, also that naturally the smallest corps, that is, the construction corps and the civil engineer corps, relative to the supply corps led to their getting larger percentages by the Bill of August 29, 1916; also at a certain time, thirty years back, there was an hiatus in the supply corps when practically no appointments were made for ten years; also that through fluctuation in promotion one corps for a time has slow promotion in the lower grades and fast promotion in the higher grades, and others vice versa.

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It will be noted that in general advantage accrues to the former staff officers because of the putting into effect the age in grade retirement provision upon their transfer to the line, and advantage accrues to the present line officers of lower grades from the fact that, in general, the staff officers transferred are probably at a greater age on account of there not having been placed into effect, the age in grade retirement in the present staff corps In time these two propositions will be equalized to the benefit of all former corps.

2. Before discussing in detail the fourteen sections of the proposed bill, a few general remarks as to its purpose, general character, scope and effect will be presented.

3. This article is not the attack of an "anti-amalgamationist," nor is it the defense of an "amalgamationist." It is an attempt to examine the proposed bill from all sides, to discuss its most important features; and, it is hoped, to bring to light certain conditions intimately connected with amalgamation, which have not heretofore received the attention they merit.

4. *Purpose of the Bill.* The proponents of the bill have failed to state what benefit is to accrue to the Navy if the bill becomes a law. It is natural to suppose that direct and tangible benefits, to the Navy and to the nation, should result from the bill, otherwise there would be no purpose in enacting it into law. Nevertheless, this important point has been omitted. There is no doubt that certain conditions existing at present in the Navy are unsatisfactory to practically all naval officers, but I believe it can be clearly shown that these conditions are not necessarily caused by the existence of separate corps in the Navy, and furthermore, that amalgamation of the technical corps with the line will not of itself correct these conditions.

5. Upon studying the proposed bill carefully it is plainly evident that it is not an *amalgamation* bill, but an *elimination* bill. After those officers above thirty-one years of age, who are now in the staff corps and who do not qualify for line duties, have disappeared from the Navy List, there will remain none who are expert in the specialties necessary for the proper administration of the Navy's business. Absolutely no provision whatever is made for the recruiting and training of specialists in pay matters, naval construction and civil engineers, nor is there any assurance that future officers who may desire to specialize along these lines will be permitted to devote the principal part of their time to such

specialties. It has been stated that these matters should be left to the administrative action of the Department, that is, the Secretary of the Navy; but the experience of those officers who have been interested in engineering from 1898-1923 is of itself sufficient to deter any ambitious officer from attempting to specialize in any work.

6. The proposed bill is an elimination bill rather than an amalgamation bill in another respect. Four years from the date of its passage, say July 1, 1928, the provisions now applicable to the line regarding enforced retirement due to age in grade are to be applied to the members of the former staff corps. A glance at the official Navy Register of January 1, 1922, will show that on July 1, 1928, this age in grade retirement rule will remove from active service a great many of the skilled and experienced officers of the rank of rear-admiral, captain and commander of the construction corps, the civil engineer corps, and the supply corps. On July 1, 1928, about sixteen out of twenty-three civil engineers of these ranks will be retired; in the construction corps fourteen out of forty-seven; and in the supply corps thirty-five out of seventy-seven. It is true that such a wholesale removal at one time of experienced officers in these higher grades will induce more rapid promotion, but the loss of their training and experience is one that the Navy can ill afford to stand, especially when it is considered that no legal means are provided whereby such officers can be replaced.

7. *Inequalities in the Bill.* One particular feature of the proposed bill is especially repugnant to those staff officers who have heretofore worked hard at their profession and who take pride in it. The bill provides that any former staff officer must pass a qualifying examination before he can perform line duties, but on the other hand, any line officer can be ordered to perform any staff duty without having to pass a qualifying examination.

8. The arrangement of officers on the single list in accordance with their "adjusted precedence" as prepared presumably by the writers of the bill, not only shows certain apparent inequalities that will cause invidious comparisons to be drawn as between individual officers adversely or beneficially affected by this arrangement, but, which is more important, shows a condition of "bunching" of staff officers and line officers in certain positions

that will eventually operate to delay promotion of the line officers below these groups of staff officers, and vice versa; and at recurring periods will cause the tops of the grades of rear-admiral, captain and commander to be filled by officers of the former staff corps. For example, at the top of the commander's list on the combined list, there is a group of about thirty staff officers of whom about twenty-two are paymasters. If these officers remain in the pay corps, they would probably not be promoted for four or five years; but being transferred to the combined list in this advantageous position, they will probably all be promoted in less than two years.

9. Such groups of staff officers at the top of any one list, particularly in the ranks of rear-admiral, captain and commander, will inevitably reduce the number of line officers in these ranks available for command and military duties afloat. Also the line officers immediately following the group of thirty or more staff officers at the top of the combined commanders' list will have their promotions delayed at least one or two years until after the staff officers have been promoted, whereas, without amalgamation these officers could expect promotion in the near future.

10. *Summary.* Summarizing then, the proposed bill is a measure which will eliminate the technical corps instead of amalgamating them; this elimination being due, at first, to the operation of age in grade retirement, and in the future, to lack of any provision for recruiting and training future specialists.

POSSIBILITIES OF AMALGAMATION

As has been intimated before, whether any officer is in favor of, or opposed to amalgamation depends in the first place upon the definition of amalgamation. This much used term seldom means the same thing to any two officers. A "pro-amalgamationist" when pinned down, will usually say that it is a means for putting all officers on the same list, that it will do away with "cliques," stop the old "line and staff" arguments, eliminate friction, and increase flexibility in assigning officers to duty. Such replies are vague and indefinite, and leave out of consideration the very important fact that if the Navy is to keep up-to-date in its rapidly increasing variety of engineering and technical duties, then the Navy must provide officers of skill and experience in

each of these special lines. Recent public addresses by high-ranking naval officials have stressed the improvements and discoveries made by the Navy along engineering lines that have been of benefit not only to the Navy, but to the country at large. Does anyone believe this work could have been done unless the naval officers who did it had *specialized* in their work? Does anyone really believe that the "all-round" naval officer can produce the *best* in radio, in turbine design, in boilers or propellers, in the design of hulls, in the lay-out of power plants? The *best* in any line of endeavor can only be produced by one who, having the ability and the desire, is afforded the opportunity to work in his chosen line. To reduce it to an absurdity, why does the "all-round" man in civil life call upon doctors, lawyers, architects, and garage mechanics?

But, leaving this phase of the question for the moment, let us return to the definition of amalgamation. After being discussed more or less continuously for fifteen years, a few particulars are available from which a scheme, if not a definition, can be built up. For example:

a. Few, if any, officers would object to removing the staff distinguishing marks from the uniform.

b. Also, practically no objection would be made to abolishing the staff titles for the various staff grades, such as naval constructor, pay director, assistant civil engineer, thereby leaving the titles of rank alone; that is, lieutenant, captain, etc.

c. It is also believed that there would be no objection to combining all officers on one lineal list in the Navy Register, if each officer were placed in his proper position on that list. The difficulty in this regard is deciding just what is the "proper place" for the staff officers transferred thereto. This will be taken up again later in more detail. For the present, assume that the "proper places" have been found.

d. There would appear to be no objection to suffixing to an officer's name, an asterisk or letters to indicate that he was specially skilled and trained along certain particular lines, such as naval construction, civil engineering, radio, storekeeping, gunnery, yard administration, etc.

e. Finally, it is almost universally admitted that duty at sea is a most valuable and necessary experience in the life of every

naval officer, with the possible exception of the civil engineer. Even in their case I believe a certain amount of sea service would be of inestimable value in perpetuating naval tradition, increasing the esprit de corps of the Navy as a whole, and briefly, in teaching all officers to "speak the same language," and work for the same big purpose—the Navy as a whole.

What have these five proposed steps accomplished? A single list of naval officers with identical uniforms and titles for the same rank has been created, on which special aptitude and training is indicated, and provision has been made for all officers to perform a certain amount of sea service. On the face of it this would appear to be a fairly reasonable and accurate definition of amalgamation.

But several important things remain to be decided before such a list with its seagoing principle can be made to "work." These are:

a. The arrangement of the list.
b. The frequency and duration of sea duty.
c. The kind of duty to be performed, and its corresponding authority and responsibility.
d. Rights of promotion and retirement.
e. The recruiting and training of specialists.

If an agreement satisfactory to all concerned can be reached on these five points it seems evident that the difficulties of making the amalgamated list "work" will have been solved. On examination, however, it will be found that the difficulties are not very easy to surmount. Personal interest, temporary or future advantage, corps spirit, professional pride, honest differences of opinion as to what is best for the Navy, past irregularities in promotion, questions as to legitimate scope of duty, succession to command, and many other vexatious problems will present themselves. The following outline suggests methods of treating these questions. The writer holds no brief either for or against "amalgamation," but, having indulged in "destructive criticism" when discussing the "fourteen points" of the proposed bill, is now trying to examine in a constructive way the possibilities of "amalgamation" on the general supposition that "something is wrong" and therefore "something ought to be done about it."

That "something" is wrong, and has been wrong for many years is the firm conviction of a large and increasing number of naval officers, but whether this "something" is the corps, the appropriation system, the bureaus, the accounting system,—or all or none of these, only a few have taken the trouble to analyze.

It is convenient to take up the five points in a slightly different order from that in which they were first presented.

Right of Promotion and Retirement. This touches the heart of personal interest and possible selfishness. The comfort and well-being of an officer's family may depend upon it, and as a result, the value of his services to the Navy. Rare is the man, who can render loyal, whole-hearted service, when smarting under a conceived injustice affecting his rank and pay, and his assurance of a livelihood when his active work is finished. Therefore, all officers now in the service should be assured of at least the same privileges as to these rights that they now enjoy. This is, in effect, nothing more than enunciating the clause that usually appears in personnel legislation; that nothing in this bill shall be construed to reduce the pay and allowances now granted by law, etc. Practically, it means that the age in grade retirement rule should be made optional and not obligatory in its application to the officers of the former staff corps who continue their technical duties. Other existing retirement laws should remain in force as now written or as changed in the proposed bill. Ex-warrant officers should have graded retirement based on length of service in grade instead of age in grade. This is covered by existing law.

So much for retirement. As to promotion, the same principles apply, but they are perhaps not so easily applied. Irregularities in promotion have existed in the past in the line as well as in the staff. Unequal probabilities of promotion even now exist between officers of equal length of service but in different branches of the Navy. It is, I believe, humanly impossible to draft a law that will correct existing conditions and at the same time provide equal justice for all in the future. All of the inequalities which now exist had their inception in irregularities in taking officers into the service. To prevent such troubles in the future, therefore, provision must be made for taking men in at the bottom as regularly and as steadily as is compatible with the changing

allowed number of commissioned officers. This applies to the creation of specialists as well as to the graduates from the Naval Academy. For the present members of the staff corps the most equitable scheme for promotion would be, when a given number of vacancies in any rank are to be filled, to select officers in proportion to the total numbers in the line and staff as they exist on a given date, say January 1, preceding the passage of the act. For example (without attempting to use the correct numbers), if twenty-five commanders are to be promoted, select one civil engineer, two naval constructors, three paymasters, and nineteen line officers. This is not by any means a perfect solution, but it does provide an assurance of promotion that is wholly lacking in the proposed bill.

Fear has been entertained in some quarters that the constitution of the Selection Board, six line and three staff, with seven votes required for selection, might result in partiality. An alternative would be a separate board of staff officers for each group of staff officers to be selected, or a varying board having six line members, and three staff members all of the same corps as the staff officers to be selected. The latter alternative seems the best solution.

The examination for promotion for former staff officers now above the age of thirty-one and below the rank of commander should be in two parts; first, a broad examination on general naval subjects; and second, a special examination on staff or technical duties. Officers of the former staff corps of the rank of commander and captain should only be given a technical examination. Officers now below the age of thirty-one should be examined as required for line officers at present, unless they have qualified as specialists (of which more later); in which case they would be given a broad examination on general naval subjects and an additional examination on their specialties.

Arrangement of the List. The inequalities, and the "bunching" of staff officers on the combined list prepared according to the "adjusted precedence" as provided in the proposed bill have already been referred to. The initial arrangement of the combined list is highly important, as upon it may depend an officer's chances of promotion and retirement. In accordance with the principles expressed in the preceding remarks on promotion, it is suggested that the best solution would be to scatter the former

staff officers in any one rank, among the line officers of the same rank, from the top of the list down, in proportion to the number of line officers and staff officers in the Navy on any given date. If the promotion scheme outlined under the preceding section be agreed to, then the initial arrangement of the combined list ceases to be of major importance, and resolves itself into little more than a list of precedence at official functions. If, on the other hand, the "proportional promotion" scheme just referred to be not accepted, and further, if the age in grade retirement rule be applied to former staff officers, then the initial arrangement of the list will vitally affect all officers' chances for promotion and retirement.

Frequency and Duration of Sea Duty. The proposed bill requires that all officers, except staff officers now holding the rank of captain, shall have had at least two years' sea service on sea-going vessels, in grade before promotion. The average age of the graduates of the Naval Academy may be taken at twenty-two. The compulsory retirement age for captains is fifty-six. There are therefore thirty-four years of active service below the rank of rear-admiral. From ensign to captain inclusive there are six ranks through which an officer passes, in each of which at least two years must be spent at sea. Six times two is twelve; that is, out of thirty-four years' service, twelve years (more than one-third), must be spent at sea. For the "all-round" line officer this is perhaps not too much. But it is seriously questioned whether such a large proportion of sea duty is desirable or necessary in other cases. In many instances the specialty which an officer desires to follow may be pursued both at sea and ashore, so that a large proportion of sea duty will not operate to his detriment as such specialist. On the other hand there are several classes of naval work, among which may be mentioned shop management, administration and management of shore stations, civil engineering work, storekeeping ashore, accounting and cost-keeping, etc., in which service at sea for protracted periods can offer few opportunities for experience and improvement except in a very general way. Wiping out twelve years from a possible total of thirty-four years of application and usefulness in such cases is decidedly bad business. This rigid requirement of two years' sea service in each grade should therefore be modified for certain specialists.

At present the civil engineers do not go to sea at all. The supply officers have practically the same amount of sea service as the line. The naval constructors lie between the two. Few line officers realize the amount of *practical* sea duty performed by naval constructors. The constructor members of trial boards and the Board of Inspection and Survey for Ships gain sea experience in quantity and quality that is exactly what is needed for making alterations and repairs on old ships and perfecting the design of new ships. Such sea-going is for the avowed purpose of finding out "what is the matter," and "seeing how it works" and provides an essential link between the designer and the operator. A naval constructor on the Board of Inspection and Survey goes to sea every week and observes the behavior of vessels when performing evolutions that many a line officer sees but a few times in his whole career.

But, there is no doubt that a certain amount of sea service for all officers would be highly beneficial for many reasons. The amount and duration of it for members of the former staff corps now above the age of thirty-one, and for our future specialists, should be adjusted to the requirements of the staff officer's technical duties and the needs of the specialty. The following are offered as a substitute for the two-year requirement of the proposed bill:

(a) Commanders, captains, and rear-admirals of the former civil engineer and construction corps should not be made to go to sea at all as a requirement for promotion. They should be sent to sea upon their approved application or when circumstances connected with their corps' duties require it. Except when on special duty as "observers," they should be assigned such duties at sea, commensurate with their rank as they may demonstrate their ability to perform. (In the case of civil engineers this will have to be interpreted liberally.)

(b) Members of the former staff corps below the rank of commander and above the age of thirty-one, should be required to go to sea for not less than one year in each grade below rear-admiral for civil engineers and naval constructors, and two years for supply officers.

(c) All officers now below the age of thirty-one should be required to have two years' sea service in each grade before they can be promoted; except that when any such officer has elected to follow a specialty, has been given training or schooling in such specialty and has qualified therein, the sea service required of him in the grades of lieutenant commander, commander, and captain shall be only such amount as shall have been determined by a board appointed by the Secretary of the Navy as proper for such specialty.

Recruiting and Training of Specialists. One of the most important objects to be attained by any amalgamation scheme should be the welding of the officer personnel of the Navy into a harmonious whole, each member of which should be trained to co-operate with all the rest for the good of the Navy. This applies to specialists or members of technical corps with even more force than to the line. The best way for all officers of the Navy to gain the same "Navy" viewpoint is to require all of them to receive the same training on entry into the service. Excepting the rights of certain warrant officers to be given commissions, therefore, all officers should be taken from the Naval Academy. This single source for all future officers can then be made a most powerful means for inculcating those traditions, naval habits, and ideas which form the backbone of naval morale, at a time when youth is particularly susceptible and retentive. Right ideas gained between the ages of sixteen and twenty-three usually stick, and a subsequent diversion of duty to special lines seldom destroys the feeling of brotherhood engendered by four years of close contact at the Academy. By all means therefore, let us recruit all of our officers through the Naval Academy.

Starting then with a common education, principally "book learning," a couple of years at sea is required to grow up, and to see and experience the application of this "book learning" to the manifold activities of that great machine we call the Navy. Until such practical experience has been obtained no young officer is really competent to decide just what particular phase of navy work appeals to him more than any other, and whether or not he is fitted for it. Having finished his two years at sea, he should be permitted to express his desire to specialize, and if his request

be approved he should be given the additional training or schooling which will provide the ground work for becoming thoroughly competent in his specialty. Three corps of the Navy having been abolished, and there being such a great variety in naval work, these specialties should not be limited to those heretofore included only in the supply, civil engineering and construction branches. The Secretary of the Navy should establish certain "authorized specialties" for which the Navy has need, and for which courses of training will be established. In these "authorized specialties" might be included:

Ordnance, aviation, yard administration, naval construction, electricity, radio, submarines, engineering, cost keeping, storekeeping, civil engineering, strategy and tactics, etc.

The list of "authorized specialties" should be revised from time to time to keep pace with the advances in the art of war and the development of naval material.

No officer, even after completing a special course of instruction, should be qualified as a specialist until he attains the rank of lieutenant commander, but before reaching that rank he should not only be given ample opportunity to pursue his special work, but in addition, he should be required to pass a graded examination in his specialty prior to each promotion. On examination for promotion to lieutenant-commander his record of performance in his specialty as shown by his fitness reports and all other available sources of information, should be carefully weighed and his successful passing should be indicated by adding to the wording of his commission "qualified in ——." Failure to pass in his specialty in any subsequent examination for promotion should involve the loss of his qualification, and the additional requirement of having to pass the usual examination for a non-specializing officer before he can be promoted.

Each officer specialist, both before and after qualifying as such, should be given duty involving the exercise of his specialty for at least two-thirds of his time in each grade. (Assuming an average of six years in a grade, this means at least four years in each grade.)

The allowed number of specialists in the Navy and the allowed number in each grade, including those not yet qualified, should be established by the same board that fixes the number and desig-

nations of the "authorized specialties." When the allowed number in each grade is established, then the principle of "proportional promotion" will insure that the proper number of specialists is maintained at all times in each grade.

The scheme outlined under this heading provides that:

(a) All specialists are Naval Academy graduates.
(b) Courses of instruction are provided for all authorized specialties.
(c) Specializing officers will be given duty corresponding to their specialties, plus a possible small amount of general duty.
(d) Promotion for specialists is assured.

As a final remark on this particular phase of the personnel question I wish to urge the extreme desirability of every officer in the Navy taking the War College course. If personal attendance for all is not possible then at least the correspondence course should be required, and it should be taken as early as practicable in an officer's career.

THE KIND OF DUTY TO BE PERFORMED; ITS CORRESPONDING AUTHORITY AND RESPONSIBILITY

Inevitably, in discussing the four preceding headings, reference was frequently made to this most important question, because upon it depends the ultimate success or failure of any amalgamation scheme. With all due respect to the line's jealously guarded prerogative of exercising "military command," especially command at sea, the fact remains that unless every officer be given authority commensurate with his responsibility a tremendous handicap is at once imposed upon him and the success of his work is imperiled. If we desire to amalgamate, in the amalgamation must be included all of the privileges and rights of all parties to it, or else all parties must sacrifice the same rights. If this be not done, instead of amalgamation, we would have absorption or elimination and more or less injustice. The best solution of this question of duty and command that I know of is contained in the following proposed bill or part of a bill which is the result of much study on the part of another officer:

That officers of the Navy shall be eligible for any duty at sea or on shore compatible with their work to which the Secretary of the Navy,

with due regard to their training, experience, and demonstrated capacity, may assign them, and while so assigned they shall have and exercise full authority and command over all officers and enlisted men that may be serving under them.

In my opinion this quotation expresses briefly but completely all that need be said on this subject.

WILL AMALGAMATION SOLVE THE PROBLEM?

For the sake of argument, let us assume that there has been described an acceptable amalgamation and means for making it "work." Or, if neither the Navy Department's proposed bill nor the scheme proposed herein be acceptable, let us assume the existence of some other type of amalgamation. Will any amalgamation scheme remove the vague but none the less real troubles that beset us?

There are two kinds of duty in the Navy, that which leads to command at sea, and that which does not. Consolidation of the Navy List, and perfect flexibility in assigning officers to duty would make every officer potentially at least, available for sea command. But some able officers would rather not command at sea, and some, while invaluable for other work, are incapable of successfully commanding at sea. If all are placed on a single list, and the criterion of ability is made fitness for command at sea (as it properly should be for the majority of officers), then necessarily a small but important group of officers will not receive the recognition and rewards to which their special talents entitle them. On the other hand, the making of special classes formed of such officers has heretofore led to the creation of separate corps. Separate corps at once limit flexibility in assignment to duty, and have been assumed to be the cause of sharp differences of opinion and distressing internal friction. But does the recognition of special talents necessarily lead to separate corps, and do separate corps necessarily produce friction? A method has already been indicated whereby special skill can be rewarded—that is, guaranteed promotion and retirement—without having the alleged dangerous corps.

After all, what are the corps as they exist today? Offhand one would be inclined to say they are separate groups of officers, selected, educated and trained for the performance of certain

lines of work distinct from the work of the rest of the Navy. A little thought will show that this is not strictly true. Naval constructors are shop superintendents; "plain" line officers and "engineer" line officers are also shop superintendents. A naval constructor in Washington makes the drawings and prepares the specifications for work on a steering engine; at the yard a line officer has charge of this work. At some yards a naval constructor is manager, at others, a line officer. Line, constructors, civil engineers and supply officers, all deal with the supply, issue, and use of materials, small tools, machine tools and cranes. Again when at sea the line officer has charge of all material and machinery that come under the constructor at Washington. These examples can be multiplied indefinitely. There are many activities common to all these corps and the line, but there are also certain things peculiar to each corps. The design and repair of hulls for example, is peculiar to the constructors; the design of buildings and dry-docks, to the civil engineers; the disbursement of money and accounting (nearly always), to the paymasters; the design and operation of propelling machinery, to the engineer line officer, etc.

If a study is made of the evolution of our naval administration it will be found that originally the corps were strictly specialists and that they were the representatives in every respect of their corresponding bureaus. After the engineer corps was abolished the Bureau of Steam Engineering found itself without any corps representatives, and subsequent changes in navy yard administration have resulted in practically eliminating bureau representatives at navy yards. The growth of the bureaus incident to the increase in the Navy since 1883, and the increasing use of mechanical devices throughout the Navy, has caused an overlapping of bureau activities. The failure of the bureaus to parallel the navy yard and the ship organizations has aggravated this overlapping. As conditions stand today the doctor on board ship has charge of something that must be repaired by the engineer officer of the navy yard, but which is under the cognizance of the Bureau of Construction and Repair! This is, of course, an extreme, but nevertheless a truthful example of the overlapping of the duties of the corps and bureaus as they now exist.

The point of all this is that bureaus and corps, as organizations

and as individuals, have their duties and responsibilities so varied and mixed that everyone, in one way or another, has something to say about the other fellow's business. No bureau, corps, office, or other agency of the naval establishment has the complete authority, responsibility, and control of funds that is essential to the successful and economical performance of work. It is difficult to imagine a more fruitful source of friction and trouble. And it is to these conditions that we must look for our difficulties rather than to the lack of a single Navy list.

Take money, for example. Out of the amount allotted to a navy yard by the Bureau of Engineering nearly one-third is disposed of there as overhead, over which that bureau has no control. Furthermore, the money allotted to the yard by other bureaus determines to a certain extent the amount charged as overhead to the Bureau of Engineering. A decrease in Construction and Repair expenditures at a yard will automatically increase the overhead chargeable to Engineering. No bureau has more than a partial control of its funds, yet it is *responsible* for all of them.

Take personnel. An officer at a navy yard, or at sea, for that matter, is seldom responsible to fewer than three bureaus at the same time. The manager at a navy yard may and does receive conflicting orders from two or three bureaus. The engineer officer on board ship is responsible to the Bureau of Engineering and the Bureau of Construction and Repair, each having cognizance of part of the machinery belonging to the engineer officer.

Take material. An officer or a bureau is charged with the execution of certain work, but part, if not all of the material needed is usually provided by and in the custody of some other co-ordinate officer or bureau. If the necessary material is not available when wanted, who is to blame?

The system is to blame, and the system is responsible for nearly all the troubles erroneously attributed to corps—and for many more besides. The system, that is, the present distribution of money and duties among the bureaus; the vital differences between the organization at the Department, at yards and on board ships; the failure to modify one to suit the changing needs of the other; the hopeless efforts of the accounting system to meet the conflicting requirements of bureaus and yards; the perpetuation in the annual appropriation bill of lines of cognizance that should have

been changed twenty years ago; these are to blame. These conditions are not right. They are inefficient and costly. They inevitably produce friction and trouble. They should be corrected, and they can be corrected by a simple re-distribution of bureau duties so as to give each bureau complete control over its work and funds.

If one bureau could have all design work, another have charge of all work at industrial yards, another have all work at naval hospitals, and so on, so that as far as possible no man would have more than one bureau to look to for instructions and funds, the problem of friction between bureaus and friction between corps and individuals would practically disappear. Incidentally there would be marked saving in the cost of naval. administration Such a re-distribution of bureau duties involves each bureau having under it and in it many specialists. For example; the bureau in charge of navy yards, would, of course, require the services of specialists in yard administration, engineering, storekeeping, hull repairs and so on. Such a throwing together, for the execution of a common class of work, of diversified specialists would be the most practical kind of "amalgamation."

CONCLUSION

The foregoing somewhat lengthy discussion has attempted to describe an amalgamation which provides for the necessary specialists (which the Navy must have), preserves equally the rights of the specialist and the "all-round" officer, provides for sea service as needed for each class of officer, and insures that complete combination of authority and responsibility which must be vested in every officer if successful results are to be obtained.

Notwithstanding all this, neither the type of amalgamation described, nor any other kind of amalgamation will remove the difficulties under which the Navy is now operating, many of which have been erroneously attributed to the existence of separate corps. Amalgamation may help; but with or without amalgamation, most if not all of these difficulties can be eliminated by a re-distribution of bureau duties so that for the bureaus as for the individual officer, authority, responsibility and the complete control of funds shall form an unbroken chain, a condition which today simply does not exist.

ACROSS THE POLE BY PLANE

By Lieutenant Commander Fitzhugh Green, U. S. Navy

THE latest polar controversy is of especial significance to navy men. It may be expressed by the hypothetical question:

Granting that an air route from Europe to the orient by way of the North Pole cuts their separation from 10,000 miles to 5,000, is it worth developing despite the risk and other obstacles entailed?

Intelligent conception of the problem is not easy without a brief outline of the steps that have led to present activity in arctic aviation. There is, to begin with, that amazing renaissance of northern exploration which the world saw in the century just past. After 2,000 years of prowling around the seven seas mariners began to concentrate on the one which surrounds the North Pole. There were two reasons for this: first, the possibility of a northern passage became acutely inviting; and second, simple circumnavigation of the globe had fallen into the hands of professional traders, thereby losing its "kick" for the true explorer. A third reason is worth recording, though it is quite open to dispute: the British Navy had seen naval warfare go into a decline after such delightful scrimmages as Trafalgar; and, seeking some worthy and appropriate stimulant, turned vigorously to the north. In passing, it is to be strongly doubted whether Nelson's thrill in the heat of battle ever exceeded those Franklin experienced while dodging billion-ton ice-islands through a Baffin Bay typhoon; not to omit that the dodging was done in a pair of recalcitrant square-riggers. Sir John Franklin, as we know, perished miserably and mysteriously with the entire crews of both his vessels. Ensued years of search for that ill-fated expedition; Dr. Kane of the United States Navy taking a leading part. Peary followed Kane. And the Scandinavians, not to be outdone, entered Nansen and his school in the race. DeLong, again of our navy, laid some of the foundations for Nansen's success; and Greely of our army contributed his tragically-won

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facts about Kane Basin to Peary's ultimate possession of the coveted Pole. It was an astounding century in exploration, full of brilliant exploits, undying feats of heroism, superb achievements.

There is one strange and moving fact about that century which bears poignantly upon the subject of this essay. To Hakluyt and to Peary the world gave its moiety of passing admiration. The morbidly curious and the timidly vicarious fed upon each ghastly tale of suffering and death. There was monetary reward; also medals, and other symbols of outward appreciation. Yet ever

ESKIMO HUNTER

The Eskimo, properly protected from the evils of civilization, will become the Arctic aviator's right-hand man.

was the question asked—jeered sometimes, almost: *Why do they do it?* And Hakluyt, or Kane, or Peary would reply: "To reach the Indies traveling west; to find Sir John Franklin; to give America the prestige of first reaching the Pole. . . ." Laughable! Such trivial reasons cannot even remotely account for the sacrifice, the suffering, the physical and mental torture those men endured. The true reason cannot ever be limned in words. To attempt it is vanity; but here is an attempt:

The explorer has always been a pioneer in humanity's everlasting crusade for knowledge. That the chalice he retrieves may hold but dregs is ever of little moment. His passioned search

goes on. Blindly, undaunted, he toils and suffers and dies that one more sentence may be scribed upon the tablet of mankind's cosmic knowledge. And then a century, ten perhaps, will pass before that sentence can be allocated in the total paragraph. . . .

This new scheme to fly across the Pole is one of the first items of allocation. That is to say, the profit that shall ultimately accrue from polar aviation quite properly belongs to that long line of courageous mariners who undeviatingly persisted in their valiant campaign against the sealed mysteries of the arctic. When bluff old Sir John Franklin vanished with two of His Majesty's finest vessels and eight-score British seamen the Empire cried its resentment around the world. Such waste of lives, of money, of property and prestige! Such absurdity, such foolhardiness, to seek to penetrate so bleak a region where man could obviously never live nor find the slightest reason for even again visiting . . . . And yet the scenes of Franklin's tragedy shall unquestionably be once more the scenes of man's activity: indeed, he left to us the charted positions of the most logical landing fields and the best protected refuelling stations in the American Archipelago!

When Kane and Peary spent the people's money public wrath arose against such squandering. Both recount the pain of personal attacks based on their supposed nefarious schemes to exploit personal fame at the expense of wholly disinterested taxpayers. "What is the sense of it? Why don't you stay home and be comfortable? How can anyone ever be benefited by such ridiculously misdirected zeal?" There was justice in these questions. The generation that lived and asked them saw Kane return a scurvy-eaten wreck, the bones of his ship left bleaching on the ice-foot north of Etah, the bodies of his men in nearby cairns; saw Peary come back crippled by loss of all his toes, his Eskimos as well as white men having died a thousand miles beyond the tree line.

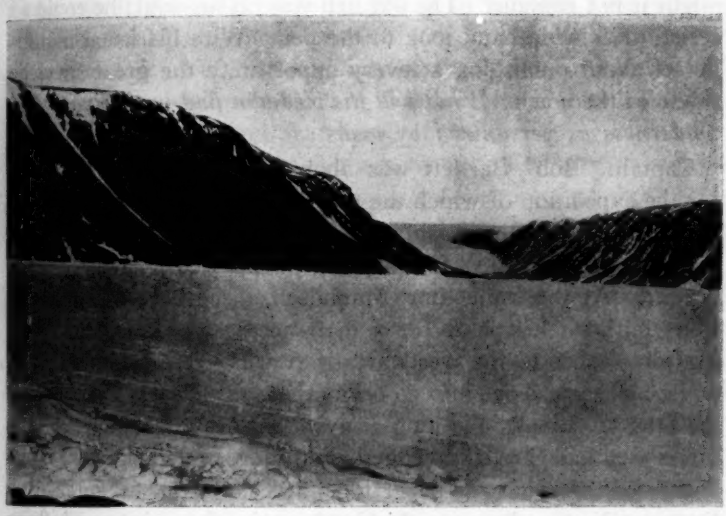
Only now the dividends begin to come. For the way that Kane and Peary opened to the north is the way to the northern tip of Grant Land. And Grant Land, which lies just west of Greenland, is exactly half the traverse between London and Pekin. And the first commercial company that lays down a permanent schedule between those great centers of civilization shall begin

its plans by hauling out old diaries which were written in the igloo's flickering candlelight, temperature minus sixty, by men who toiled and suffered and died, blindly and undaunted, that one more sentence might be added to our knowledge of the globe.

Polar aeronautics began in 1897 when Dr. S. A. Andreé conceived the idea of drifting across the Pole in a balloon. He established headquarters in Spitzbergen and built a large shed for the protection of his gas bag. His whole equipment was pathetically like that of a parachute jumper at a county fair. His only means of locomotion was the capricious wind. His rudder was nothing more than a long rope dragging on the ice. His chances for escape, should the balloon for any reason fail, were assured by a polar traveling outfit that wouldn't have filled a fair-sized steamer trunk. But his faith in his success was superb. "For," said he, "success to me consists not of a safe return; or even a sight of the northern axis. Success or failure must I measure by the information, no matter how intangible and small, that I shall add to what we know already about the arctic regions!" With this sublime faith he sailed away. We have of his balloon a last few photographs as it disappeared out over the dreary waste of ice. He never returned. Once, ten years later, an Eskimo from above the Coppermine River passed along a tale about discovering some strange thin fabric, cord, a few tools of white men. Brave Andreé's balloon, perhaps. That was all.

Walter Wellman was the next polar airman. In 1907 he succeeded by indefatigable exertions in anchoring his amateurish dirigible on the Spitzbergen shore not far from Andreé's site. This motor-driven machine was a vast advance over the little bulbous drifter of his predecessor. In America it had proved a tractable beast. Even in the arctic it gave great promise of success. But Spitzbergen is far from home. It lies within the eighty-second parallel of latitude. It groans beneath eternal ice and snow. Its night is the months-long darkness of the polar regions. Its day is a treacherous incandescence, a fact which escaped even the astute Wellman. He watched the sun swing around through twenty-four hours while myriad sea-birds made the black cliffs echo with their din. He watched the white floes drifting gently in the summer tides. All was calm and white and shining, the deadly tranquility of arctic summer. Deadly

because one never knows at what instant the swirling rush of a summer blizzard shall sweep in a blinding torrent from the ice-cap. Deadly because, when the blizzard comes, man's most ingenious machines are but puny toys in its fearful grip. Wellman started. The blizzard came—unheralded. And the dirigible in blind helplessness drove its tender nose to destruction against the flinty face of a thousand-foot glacial precipice. Wellman was beaten. But he was not lost. And while the sublimity of his purpose as well as the skill and zeal of his endeavor were fully



FOULKE FIORD

The great fords debouching into polar waters will provide ideal conditions for hopping off or landing.

equal to Andreé's, his Yankee spirit saved him. "Tough," he commented. "Tough as hell!" And that was all.

Then Stefansson lost himself. At least in 1914 he penetrated so far across the top of America and stayed away so long that men who understood such work said he never could come back alive. Admiral Peary, co-operating with the Aerial League of America, suggested a rescue by plane. A search was projected wherein a series of flights would be made from promontories along the shores of the Polar Sea. The risk would be desperate because aviation in those days was not the dependable locomo-

tion that it is today. But since arctic work always involves desperate risks that side of the question was not of great concern. However, the venture never came to a head. Stefansson returned, as he always does.

But Peary was not satisfied. An explorer to the core, he still felt a peculiar humiliation in man's ignorance about the arctic. He saw there the greatest unexplored area of the earth's surface: a wide ice-hidden sea 2,000 miles in diameter. What lands and peoples, what wealth, what curiously valuable information might it not contain? The old itch was on his soul; he could not resist. His whip-hand took to the pen. With his usual industry he set about publishing at every opportunity the great surviving riddle of the north: *What will the birdman find in that vast white wilderness as yet untrod by man?*

Captain "Bob" Bartlett was about to command a relief ship for the expedition of which the writer was a member. At Peary's suggestion and with the aid of aviation experts he laid down the most practicable routes for mapping unexplored polar areas from the air. At the same time Amundsen, discoverer of the South Pole, initiated his plans for a drift across the Polar Sea starting somewhere to the westward of Alaska. He brought his interest and experience into co-ordination with Peary, Bartlett, and the others. Finally the long-delayed exploration which for centuries men had carried creepingly with dogs and sledges was completed for the aviator in paper form at least. But war intervened. Fortunately too, because development in the science of flying leaped forward with a speed that only the stimulant of man's desire to kill could bring. Peary died. Bartlett's plans were held up. Amundsen alone actually got away. At the moment of writing he alone is north, somewhere with his little ship, his plane, his indomitable will, along the northern edge of Alaska. Andrée's balloon . . . . Wellman's dirigible . . . . Admundsen's plane . . . . Long years between. Slowly the fight goes on—.

Eventually man will win this fight. Man eventually wins every fight. As usual there is plenty of sentimental interest in the way he has fought. Indeed few struggles in the history of the race have been so vividly enthralling as that for the Pole. But such interest is only passing. Of vital import, of pressing import almost, is:

How will the United States be affected should polar aviation become a common occurrence?

As in most questions of world economics the answer is both commercial and military.

On the commercial side statistical figures are significant. For example, federal reports show that in one year we exported to Japan $453,147,063 worth of merchandise. In the same year we shipped to Scandinavian countries $359,682,949 worth. It would savor of soap-box oratory to claim that if the distance from Christiania to Nagasaki were cut in half by a North Pole route—which it would be—the United States would immediately be short-circuited. Yet that certainly is the indication. It would be gross exaggeration to declare that we should lose a billion-dollar trade if Japan and Scandinavia began to supply each other with what we supply both of them today. Yet sure as sunrise we should lose. It would be absurd to suppose that these antipodes would ever prefer a trade-route clear of marts so lucrative as ours. Yet northern marts are growing even now.

A large percentage of those huge sums is freight. Freight sent 10,000 miles by ship and rail as it is today from Europe to the Orient around the world may well tomorrow cost tremendously less when sent but 5,000 miles across the Pole by dirigible. And even a one per cent saving on a billion dollars is no mean gain: $10,000,000 in fact.

Pursue this line of thought to other countries and other activities. Canada and Siberia with their growing railroads are potential Roman Empires. Their future is not of posterity either, but of tomorrow. Stefansson has convinced the Canadian Government that its resources are open clear to the Polar Sea. Only the other day a deposit estimated at 32,000,000 tons of excellent coal was discovered in Saskatchewan. Oil fields are being developed within the arctic circle. Both these vast commercial nations lie dormant. They are just being populated. They are above the latitudes of intensest commerce. But give them an open road across the top of the earth and a cataract of trade must start.

Diversion of passenger service would be even more certain. Of course tourists and tradesmen would never cease to visit the States any more than they have ceased to visit the modern sur-

vivors of ancient Mediterranean civilizations. But the business warrior is a practical man. He is not going to travel from New York to Chicago by way of Niagara Falls after his honeymoon visit. He is going direct. Minutes and miles mean dollars to him. And enough minutes and miles are going to be saved in 1935 by a polar route from Europe to Asia to pay off our national debt!

The military facts are even more simply portentious. Safety, any military man will tell you, lies for the individual as well as

GREENLAND

Most northern coasts denuded by recent glacial action offer only small areas fit for landing fields.

the nation in logistics. Logistics may be defined as that part of military activity outside the actual fighting. The backbone of logistics is communication. The nation which can communicate wholly and successfully with its allies has a tremendous and almost insuperable advantage. The belligerent that can keep open its lines of supplies can usually fight on indefinitely. Germany almost won the war by cutting sea-borne communications between England and the world. The Allies did win the war that way.

In war between the United States and any European or Asiatic

power the polar air route must come to play a conspicuous part. We can blockade the seas. Sea travel is slow and must move to and fro over more or less definite lines. Ocean search curves are mathematically successful always. But air travel is swift and cunning; it is superbly effective when there is dodging to be done. We should be removed from the main line of our enemy's communications. We should, broadly speaking, find ourselves flanked by enemies even as Germany was; only more so. For Germany all but severed the threads that bound the eastern and western fronts. Could we, in the same way, cut a myriad possible routes across the arctic waste—an area the size of an entire continent? Scarcely.

It is a matter of sadness to anticipate such things. The man who once has learned with intimacy what war is hopes with prayerful heart never to see war again. Yet the world is not yet done with war. To deny this is to invite disaster. To deny the possibility of our ever defending our commerce or our honor against the predatory interests that already threaten both east and west is to play the silly ostrich. Se we must meet the strategic meaning of a polar air route as we met that of the Panama Canal: A military problem involving our future safety.

Alaska, of course, will be the scene of our new arctic activities. We shall have a new breed of warriors in the shape of Vikings of the Air, together with their water-borne tenders on the fringes of the ice-pack. We shall automatically develop the latent resources of the country. Coal there now costs twice as much as it does at home. But helium for dirigibles can be manufactured as cheaply at the mine's mouth north as it is in Texas. Spruce and fabric for innumerable planes are indigenous. Huge caribou herds bespeak an inexhaustible commissary.

Contrary to rumor the climate bogey is not going to prove any sort of impediment to arctic aviation. Popular opinion pictures the Polar Sea as a wilderness of elemental violence. From a scenic point of view this is true. Its area of ice-pack from forty to over a hundred feet thick is nearly as large as the United States. Its winter cold and darkness are inhuman. Its tide-jams crash and roar with each shift of current or wind. But these stage properties will never amount to real obstacles for the modern aircraft.

The flying season inside the Arctic Circle will for some years be between June and September. For five weeks in that period the actual heat per square mile received in those regions from the sun is greater than at the equator. This is due of course to the fact that the sun is working twenty-four hours a day up there. The temperature is amazingly unchanging and averages between thirty and forty degrees F. In Alaska 100 degrees in the shade has been recorded in July. Only constant evaporation on the ice-fields by absorbing heat prevents polar temperatures from

EGEDESMINDE

Danish colonies in Greenland typify the future circum-polar aviation station.

rising equally high. Sea water in the arctic never gets colder than twenty-nine degrees F. This fact holds the year around. In consequence during winter when a tide crack opens and lets air at sixty-five degrees reach the tremendously warmer water black vapor arises like smoke from a cauldron. As no great land masses exist in this ice-filled sea there can be no erratic movements of the atmosphere. Even the violent winter winds are only surface movements.

Specific dangers incident to all flying will be tremendously

reduced. Polar floes are pitted and seamed with titanic pressure ridges, bergs, and other pseudo-volcanic evidences of tidal violence. But the very forces that cause these eruptions also insure that there be vast areas of absolute levelness. For every time the field is sundered bitter cold at once congeals the water thus exposed and forms a runway scores of fathoms wide and five to fifty miles in length. These runways in summer will be ideal landing places for the aviator in distress. Likewise pits of pressure fill with water under the unsetting sun in summer and form lakes convenient for any crippled sea-plane.

A transoceanic hop between the continents approaches 2,000 miles. With a pair of dividers one can see that something close to 800 miles will be the maximum traverse between circum-polar stations. When an ocean flyer falls he's safe enough—that is, provided the sea is smooth and he has a large supply of food and is fortunate enough to be picked up in the brief interval between dawn and sunset. On the Polar Sea the ship-wrecked air-mariner will alight upon or by a solid floe. He will not be at the mercy of each wind and tide that runs. He will not be careening across an empty waste of ugly seas. On the contrary he will be almost unmoving save for the slight idle drift of the pack. For twenty-four hours a day he may send a signal column of black smoke into the sunlit heavens. Rescue will be simple, sure, and devoid of any hardship.

Colonial geography will alter vividly. Down the Mackenzie to the sea, up the Lena to its sources, will swarm a new and hardier race of pioneers. The Mississippi and the Rhine were set athwartships to advance of civilization. Great rivers of the north are parallel: they will be like lubricants to a people's movement.

Our rich northwest will become richer. Slower than the Klondike rush but tremendously fuller and more permanent will swell the urge to competition with our European friends who shall have joined hands across the Pole. Alaska will be the scene of a new empire. We have relinquished our hard-won Greenland interests to Denmark. Britain claims her Canadian boundaries clear to the Pole itself. So alone remains Alaska as our gateway to this new field of transportation.

It all seems a little far-fetched. So did aviation in 1905. Only with an effort can we shrug away the shuddering memories

of the north we read about in childhood and picture that fearful desert thronged with caravans of the air. But that is always the way with progress. Caesar pushing up into islands that are England won the caustic comment: "Only a lunatic would contemplate a victory in a land so distant from the Mediterranean."

With radio and planes the Pole is this year fifty times as close to us as London was to Rome.

WE MUST HAVE IT!

By Lieutenant Commander F. S. Craven, U. S. Navy

IT IS known that several efforts have been made in recent years toward the establishment of a Gunnery School for the Navy. Some of its proponents have been influential officers in important official positions; yet we have no school. The present writer therefore does not expect much tangible result from this article. He hopes merely to keep the subject alive—perhaps to give it aspects not fully covered previously—thus to assist in crystallizing favorable service sentiment into a service determination to secure the establishment of the school.

It seems probable that the service has not realized the imperative necessity for the school because the whole extent of its functions has not been perceived. It is not at first apparent that almost all of our gunnery evils, not only of personnel and of method, but of material, would be corrected simply and naturally through its operation. For instance, we all know of cases of defective design of equipment. Some are defects in basic theory; others in details. Not many of these could have occurred had the Gunnery School been in operation. We know of cases where costly equipment has been damaged through ignorance of its use or upkeep. These could not have occurred with a trained personnel. We have seen ships excellently equipped make miserable failures at target practice, discouraging their enlisted personnel and throwing unwarranted discredit on their equipment. The school would have done much to prevent such occurrences. Finally, we know that gunnery knowledge in the service, particularly on the smaller ships, is unrelated, fragmentary, frequently defective, and sometimes non-existent. This is largely due to placing inexperienced and untrained officers in active control of equipment which they do not understand, and facing them with highly developed gunnery problems when they are yet ignorant of the basic principles. The last is the popularly supposed reason for

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wanting a Gunnery School; but the others are of equal or greater importance. The writer will attempt to show why.

At present we train gunnery personnel in the school of experience. Most observers will admit that experience is an excellent teacher; but it has its disadvantages from a naval standpoint. Perhaps the most serious one is the length of time usually required to learn by that method. Thus, most of those actively engaged in gunnery are in the process of education. What they have learned is often not well balanced, because experience presents its lessons without regard to logical sequence.

Experience is a versatile teacher, adapting its lessons to the characteristics of the student. There is an advantage here, from the viewpoint of the individual, but from the service standpoint there is the vital disadvantage that divergent views grow up. It becomes difficult to develop an accepted basis upon which to premise the training of newcomers. It often happens, also, that those who have acquired knowledge through experience either are not able to impart it to others, or else fail to recognize the essential difference between a code of procedure, like ritual in religion, and basic principles, and so lay stress on details which mean nothing by themselves. Therein often lies the defect in such gunnery instruction as is given by individuals to individuals.

It would be wrong to suggest that effort is not made in the Navy to give a general education in gunnery. On the contrary, there is an immense literature on the subject. There are well prepared standard publications dealing with its various phases. Each year's gunnery experiences are printed and issued to the service. The trouble is that we do not profit from these things. The yearly lot of new writings cannot safely be co-ordinated and edited in the Office of Gunnery Exercises because, although the personnel of that office is selected, they nevertheless are detached from active gunnery, and so cannot test theories directly. They could only, like a jury, attempt to reach a conclusion through sifting opinions, with their own experience as a basis for comparison. Were they to edit the gunnery reports they would be adopting a method which has already led our Navy into serious errors in recent years: namely, the vitally defective method of development through the consensus of opinion, instead of through experiments and tests.

The present system might well be worse than it is, yet we must not be blinded to the fact that it can be greatly improved. The yearly reports, for instance, generally refer to special phases which interested the respective writers, but are not likely to knit in well with the theory held by more than a portion of the personnel engaged in gunnery. Where they do not knit in they are likely to be fought against, as tending to disrupt the development of the theory in which the individual is interested. Where they do knit in there is the danger that some fundamental fault in principle is perhaps being strengthened and perpetuated. They are so diverse and fragmentary that they are poor means for educating novices.

Of course certain sound principles and methods are generally recognized and used, and can be published safely. The existing standard publications contain most of these; but they too are imperfect means for education, partly because there is no consistent pressure to force the personnel to study and apply them, and partly because they admittedly contain only that which is well recognized and developed through experience. Therefore they no not include the more recent developments of modern gunnery.

As stated earlier, we have made many serious mistakes through dependence on the reports of boards or on the so-called consensus of opinion. For certain large and abstract problems which can be tested only in war, the considered opinion of a group of trained minds seems at present the best solution. But these minds constitute a permanent organization for planning—a "plans section"—and must not be confused with a board, as we understand and apply boards, nor with the consensus of opinion. Our boards usually are transient gatherings of officers who have other permanent duties elsewhere which they must neglect. They investigate superficially, consider hurriedly, and conclude hastily. Mistakes in principle as well as in detail are bound to occur, and do occur. The consensus of opinion in its best form is where an individual first prepares a plan which is issued for advance consideration. Then a conference is called for discussion, after which the best opinion is sought after, generally by the individual who prepared the original plan. If the controlling individual is absolutely impartial in reaching his final con-

clusions, and is not unduly influenced by the rank or personality of the debaters, this procedure probably would produce close to the best available opinion. But after all, it is purely opinion, and what does opinion prove? In any conference concrete things necessarily are absent, or if not—if the conference is held on the "job"—the consideration of the concrete is limited and hasty. Parts, whether of mechanisms or of methods, cannot be shaped and fitted to work properly together, as they can be when the development is by trial and experiment. And so, almost always, the result of the consensus is crude and imperfect, and often it is downright defective. We cannot permit the development of fighting means by such imperfect processes as these when it is possible instead to develop them through experiment and test. The Gunnery School would provide the means, and the test would be conclusive because made at full size under service conditions.

Another serious fault in our present method of material development is a periodic tendency toward alteration in gunnery theory. There is a similar and even more marked tendency in design theory. These variations occur because for two or three years a theory is developed by one man, or a group dominated by one man, and when this man takes up new duties (in accordance with our fixed policy of periodic changes of duty), the theory is apt to be modified or discarded to suit the ideas of his successor. There is a complementary fault in that there may be representatives of radically different views contemporaneously controlling interdependent elements of the organization for producing material, with consequent conflicts, and lack of harmonious and consistent development. These faults exist because there is no permanent organization interposed between the shifting individuals endowed with executive as well as with planning functions, who control our gunnery, and the service. The Gunnery School would serve this purpose, acting as a fly wheel to store up momentum from the outgoing régime which the incoming could not dissipate before they had had sufficient experience in their new jobs to avoid expensive mistakes. Of course the head, and the principal members of the staff, of the Gunnery School would have to be shifted occasionally, but this need not produce a lack of permanence because shifts could be

staggered, as in the U. S. Senate, and the organization would be too large for one individual to send it off on a tangent.

Before leaving the subject of material, give consideration to the wisdom of permitting experience to teach the procedure for upkeep. This practice costs us untold dollars each year. We place costly devices on ships and expect untrained officers and men to maintain them. It is true that we furnish excellent pamphlets (yet generally not so good as the British!) covering maintennance, but we forget that many otehrwise intelligent persons are not able to derive really effective information from books alone —they require guidance and instruction. Nor can we count on the application of sufficient pressure to ensure attention to such pamphlets, except on a few ships. What we require is instruction of the officers and of the upkeep personnel. This instruction would form a natural part of the work of the Gunnery School, and our existing Torpedo and Ordnance Schools would be absorbed by it. The existence of these schools was not overlooked in the discussion of the earlier part of this paragraph; they simply cover only part of the material and reach only a small portion of the necessary personnel.

To summarize: Our present method of gunnery development prevents the growth of a logical system. It produces unsatisfactory results which in turn generate a cynical attitude among the personnel. It prevents thorough development of details of design. It is frightfully expensive in money because of the numerous detached experiments which each new régime initiates, and because of the natural tendency to discard developments of the preceding régime; also, because of the injury and waste caused by untrained personnel learning by experience. It is the system that has caused us to be so backward in material development that Admiral Fiske and others have felt justified in telling us that we have been years behind other navies. In short, it appears that we are not employing our intelligence in developing the gunnery of the Navy. We are trying to work a system which will function after a fashion, but only through the application of much force which is expended chiefly in internal friction. It is a system which has produced mediocre results and can produce none else. Mediocrity opposed to excellence is sure defeat in modern war!

We have a large commissioned personnel of undoubtedly good mental quality. It contains the usual types of men, including those who are specially fitted to instruct and those who are peculiarly able to find out things by experiment. In the latter two classes are graduates of our school of experience, available now to make a start with the Gunnery School. We should select men of large enough perspective to give consideration to the suggestions of others. They should be supplied with modern equipment and with facilities for experiments. They would be stimulated in their development work by the eager interest of younger minds associated under them for instruction. Thus the school would soon thresh out the diverse crop of gunnery theories which our present system has produced. Through convincing demonstration the school would reveal unsound theories and develop good ones. Education by demonstration would nevertheless require the development of simple manuals for recording the principles and methods of gunnery for the student to take with him, and these would be kept up-to-date automatically, through the normal progress of the school. The school would naturally become the test laboratory for the fleet; the clearing house for new ideas.

To render the conception a concrete reality we should have the use of a large ship, such as an Army transport, to house the student body and to accommodate the experimental laboratory—for we should have to move the school to find the weather and other conditions which would be wanted from time to time. Then we should have also one or more vessels of the principal types, for demonstration purposes.

The chief problem, from a financial standpoint, would lie in the necessity for increasing both the commissioned and enlisted personnel of the Navy, in order to man the existing fleet and at the same time to provide the personnel for the school. About ninety per cent of the younger commissioned personnel should go through the school—say about forty per cent of the present personnel—and all of the future entrants in the lower grades. Although perhaps at first the instruction should be on a wider basis in order to catch up with the needs of the service, it is probable that ultimately the students would be confined to the grade of junior lieutenant, which is gone through in three years. The course of instruction would not require over six months;

therefore about one-sixth of the junior lieutenants, which would be about two per cent of the whole line, would be at school at all times. A smaller percentage of enlisted personnel would be required to receive instruction, but additional men would be needed to man the vessels constituting the school.

At the start the school would be a modest affair. It would be on trial. But it very soon would establish its obvious merit, and its value to the Navy would ensure its growth. The direct savings due to improved designs and to the education of the personnel in upkeep measures, combined with the indirect but probably larger savings due to a consistent gunnery system, and the avoidance of costly mistakes produced in bulk, would soon pay many times over for the school. It would be quite impossible to evaluate the increased gunnery efficiency of the Navy, which would be the greatest gain.

The school should have close tactical affiliations with the fleet, because the development of gunnery depends on tactics, and vice versa. This would come about naturally, as the school gradually absorbed the correcting of material defects. Relieved of this worry, the fleet would come to devote its attention largely to the relations of gunnery and tactics, and to gunnery principles. The school naturally would be a recipient of target practice reports. In fact, it probably would absorb many of the duties of the Office of Gunnery Exercises. The latter also would be freed of worries, as regards details, and thus would be able to devote most of its attention to moulding development along lines consistent with the war plans, and to taking full advantage of intelligence reports from abroad. To complete the picture, the school would serve as trial horse for developing the flaws in proposed forms of gunnery exercise, and, incidentally, for simplifying the paper work required in making reports, through having to apply it to actual cases.

And after all, we would still have experience working for us, with all its advantages intensified and its drawbacks removed. We would have provided it with a foundation of well disseminated fundamental principles upon which to build, and the structure would then grow along simple and effective battle lines.

AMERICAN MARINES IN THE REVOLUTION

By Major Edwin N. McClellan, U. S. Marine Corps

"AT NO period of the naval history of the world, is it probable that Marines were more important than during the War of the Revolution," wrote J. Fenimore Cooper, and "the history of the Navy, even at that early day, as well as in these later times, abounds with instances of the gallantry and self-devotion of this body of soldiers."

The first blood of the American Revolution was shed at Lexington on April 19, 1775. After Ticonderoga had been captured, on May 10, there was difficulty in holding it, and men and money were asked for. It is in connection with the resulting relief expedition that American Marines are first mentioned in our history. In the expedition, so goes the account, were sent "500£ of money, escorted with eight Marines, well spirited and equipped." Arriving at Albany, additional troops joined the expedition, which soon arrived at Ticonderoga, after passing through territory infested by hostile Indians and treacherous renegades.

The earliest Marines, as also the earliest ships, belonged to the State Navies; before there were any ships in the Continental Navy, thousands of Marines served on the State vessels. Some were attached to the *Katy* and *Washington,* of the Rhode Island Navy, when, on June 15, 1775, those warships chased ashore and destroyed an armed tender of the British Frigate *Rose*—the first enemy vessel captured by a public armed vessel during this war. The *Experiment,* launched on July 19, 1775, was the first vessel of the Pennsylvania Navy; South Carolina had vessels in commission by July, 1775; Connecticut and Massachusetts by August, 1775; and Virginia by December, 1775. The other States (except New Jersey and Delaware which had no Navies) acquired vessels on later dates.

Then on June 17 came Bunker Hill, and on July 3, George Washington assumed command of the Army around Boston. In addition, under orders of Congress he had "direction of the Naval

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Department" and well might be called the "Father of the American Navy."

On October 5, Congress directed General Washington to secure two armed vessels from Massachusetts, place them "on the Continental risque and pay" and use them to capture two unescorted brigs loaded with munitions that had sailed from England. He was also instructed to give orders for the "proper encouragement to the Marines and Seamen" that served on the vessels. This was the first time the Continental Congress ever mentioned "Marines." Washington soon gathered together a fleet from the Navies of the New England States. The vessels were manned by crews, including Marines, taken from his Army. Once on board, however, they belonged to the naval service, and in many instances there are references to the Marines serving on the *Hannah, Hancock, Lee, Lynch, Warren, Franklin, Harrison,* and *Washington.* The duty performed by these vessels had considerable effect in forcing the British to evacuate Boston on March 17, 1776, and thus the Marines shared in that success.

And so the American Marines of the State Navies and of Washington's Fleet, by their own acts, gradually established themselves in public favor. Congress became impressed with the fact that a corps of these Marines for the Continental Navy would be a fine thing.

There is a date that is celebrated every year by American Marines, wherever they are stationed throughout the world. It is November 10—the birthday of the Marine Corps. On that date, in 1775, Congress resolved: "That two Battalions of Marines be raised, consisting of one Colonel, two Lieutenant Colonels, two Majors, and other officers as usual in other regiments; and that they consist of an equal number of privates with other battalions; that particular care be taken, that no persons be appointed to office, or enlisted into said battalions, but such as are good seamen, or so acquainted with maritime affairs as to be able to serve to advantage by sea when required; that they be enlisted and commissioned to serve for and during the present war between Great Britain and the colonies, unless dismissed by order of Congress: that they be distinguished by the names of the first and second battalions of American Marines, and that they be considered as part of the number which the Continental Army before

Boston is ordered to consist of." At first the enlistment period was for the war; later this was changed to include the period up to January 1, 1777, and after that the enlistment was for a stated term.

Washington received with dismay the orders to supply the personnel for this corps of Marines, and informed Congress that to supply them would "break through the whole system" in his Army which had "cost us so much time, anxiety, and pains, to bring into any tolerable form." This was because the Marines "must be acquainted with maritime affairs," wrote Washington, and because he would have to pick the Marines "out of the whole Army, one from this corps, one from another." He recommended that the Marines be raised in New York and Philadelphia. At last Washington stated that an "insuperable obstruction" consisted in the impossibility of getting the men to enlist for the "continuance of the war." On December 14, General Washington wrote Congress, "I am at a loss to know whether I am to raise the two battalions of Marines here or not." Again, on January 4, 1776, he wrote: "Congress will think me a little remiss, I fear, when I inform them that I have done nothing yet toward raising the battalion of Marines." Washington had ample excuse for this reluctance and procrastination; for he had twenty-six incomplete regiments at this time in his Army. His views evidently prevailed, for Congress soon directed that the Marines be raised from a source other than from his Army.

All this time, however, the Continental Marines had been in existence, and were working out their own salvation. The reluctance of George Washington to give up sufficient personnel from his Army for the organization of the two battalions had no retarding effect upon the appointment of officers or the enlisting of Marines.

As events turned out the colonel, the two lieutenant-colonels, one of the Majors, and the staff were not appointed. The highest ranking officer of Marines serving during the Revolution was Major Samuel Nicholas, who after active service with Hopkins' Fleet, and in the Battles of Trenton and Princeton, performed duties at the Capital that corresponded more or less to those of the commandant today; and in addition acted, at one time, as muster master for the Navy.

The "First and Second Battalions of American Marines" were never actually organized and named as such. When the emergency or demand for the use of Marines arose, provisional units, from a squad to a battalion, were organized. When a vessel of the Navy went into commission a Marine Guard was formed and marched on board. When the object for which the provisional unit was organized had been accomplished, or a vessel no longer required a Marine Guard, the unit was disbanded and the officers and men used for other purposes.

These, however, were not the only Continental Marines. There were those who were appointed and enlisted in Europe, for the vessels of John Paul Jones' squadron, and other ships such as the *Boston*. Many of these Marines were French, and of other nationalities. In addition to these Continental or Federal Marines, there were the thousands serving on the privateers, who were sometimes called "Gentlemen Sailors" or "Gentlemen Volunteers." There were also those who were attached to vessels of the State Navies. And there were those who were detailed, from the Army, to act as Marines on particular occasions.

Marine officers received the same character of commissions as did the Army and Navy officers. Samuel Nicholas was the "oldest officer of Marines." He "entered into the service in the capacity of a Captain of Marines" (being commissioned as such on November 28, 1775) and probably received the first commission in the Continental naval service, known of today.

The methods and plans of recruiting Marines were very little different from those used today. Offers of prize-money, advance money, expense money, bounty money, pensions, and promises of ample grog rations, were the lures presented to those who were in a "recruiting mood." Handbills were used extensively to make public the recruiting propaganda. Attractively uniformed recruiting parties, preceded by drum, fife, and colors, noised their way up and down the streets of the cities and large towns and ended up at a rendezvous with a queue of patriots who thus early obeyed the command to "Join the Marines."

Benjamin Franklin wrote that in 1775 he had observed in Philadelphia on one of the drums belonging to the Marines—whose recruiters were raising two battalions—"there was painted the rattlesnake with this motto under it, 'Don't tread on me!'"

He said, knowing it was the custom to have some device on the Arms of every country, that he supposed this design was intended for the Arms of North America. It is claimed by many that this device of the Marines was on the first flag that flew from the mastheads of our first ships of war.

Philadelphia was the leading Marine Corps recruiting city of the United States, and probably the most famous of all recruiting rendezvous established during the Revolution was that located in the Tun Tavern in Philadelphia. This was a once prominent hostelry on the east side of King (Water) Street, at the corner of a small thoroughfare known as Wilcox's (later as Tun) Alley, that led down to the Delaware River. Captain Robert Mullen, proprietor of the tavern, was captain of a company of Marines.

Marine officers were also used extensively for recruiting personnel for the Navy. For example, Captains Matthew Parke, Edward Arrowsmith and Second Lieutenant Samuel Wallingford of the Marines, under the direction of John Paul Jones, assisted in recruiting the crew of the *Ranger* in the late summer of 1777; and the crew of the *Providence* at Plymouth, Mass., in 1776, was another instance.

Marines performed all sorts of duty. With necessary officers they were detached for service on board the armed vessels of the United States, and thus engaged in every important battle afloat; participated in important landing parties from naval vessels, such as the one at New Providence (Bahamas) in 1776; at Whitehaven (England); at St. Mary's Isle (Kirkcudbright, Scotland); and again at New Providence in 1778; were ordered to do duty in forts, such as Fort Montgomery in New York; performed expeditionary duty, such as the Penobscot Expedition in 1779, and the expedition down the Mississippi to the Gulf of Mexico on the *Rattletrap* at an earlier date; were detached for service with the Army during the period when they fought at Trenton and Princeton; performed artillery duty with the Army; guarded enemy prisoners; acted as guards at naval stations ashore; went to the Indian-infested forests of Pennsylvania, and brought out masts for the frigates of the Navy; and acted as officer-couriers and Continental Express Riders in America and Europe.

The principal duty, of course, was service on board the ships of the Navy. The strength of the Marine Guards varied considerably. The thumb rule which determined the strength was that there should be one Marine for each gun on the ship, but this rule had many exceptions. The frigates carried about sixty Marines but the duties expected of the various ships frequently caused a considerable increase in the strength of the Marine Guard. Boarding and repelling boarders and the close range at which naval battles were fought made the musketry fire of the Marines an important element of combat.

On board the Privateers, the Marine was a very high type of man and fighting was his only duty. When the United States Schooner *Revenge* was captured and later laid up at Portsmouth Prison in England, one of the "Gentlemen Sailors" of that vessel was discovered to be a woman.

The duties of the Marines on board ship consisted of sentry duty at important posts throughout the ship, and during action, they were often stationed in the tops, where the expert shots were of great assistance. Cooper wrote that the Marines were "strictly infantry soldiers" who were "trained to serve afloat; and their discipline, equipments, spirit, character, and *esprit de corps*, are altogether those of an Army. The Marines impart to a ship of war, in a great degree, its high military character. They furnish all the guards and sentinels; in battle they repel, or cover the assaults of boarders; and at all times they sustain and protect the stern and necessary discipline of a ship by their organization, distinctive character, training, and we might add, nature." While the Marines at times manned the great guns, "their proper weapons" were "the musket and bayonet."

Green was the dominant color of the Continental Marines' uniform during the Revolution. An officer wore a green coat with white facings and skirts turned back. The coat had slashed sleeves and pockets and had buttons around the cuffs. A silver epaulette was worn on the right shoulder. The waistcoat was of white material. The breeches were white, edged with green. Black gaiters and garters were part of the uniform. The buttons were of silver and carried a foul anchor. A sword and other necessary equipment were carried.

The "regimentals" of the enlisted man consisted of a green

coat faced with red, a green shirt, a white woolen jacket, light colored cloth breeches, woolen stockings, and a round hat with white binding. His buttons were of pewter and carried a foul anchor. While in European waters, John Paul Jones dressed his Marines in the English uniform—red and white, instead of the green as prescribed by the Marine Committee. The Marines of each State Navy also wore distinctive uniforms.

Congress prescribed the rates of pay for the officers while the pay of the enlisted men was the same as the Army. A captain of Marines received thirty dollars a month; a lieutenant twenty dollars; sergeants eight dollars; the corporals, drummers and fifers, seven dollars and one-third; and the privates six dollars and two-thirds.

Congress carefully prescribed that the Marines would share equally in all prize money and accorded them the same rights with regard to pensions as provided for the Army and Navy. The Marines of the State Navies were also treated generously in regard to pay, prize-money, and pensions.

At the termination of the struggle the Marine Corps, like the Army and Navy, was disbanded, "literally leaving nothing behind it," as J. Fenimore Cooper most appropriately stated, "but the recollections of its services and sufferings."

Chart 1. Captains to Rear Admiral.

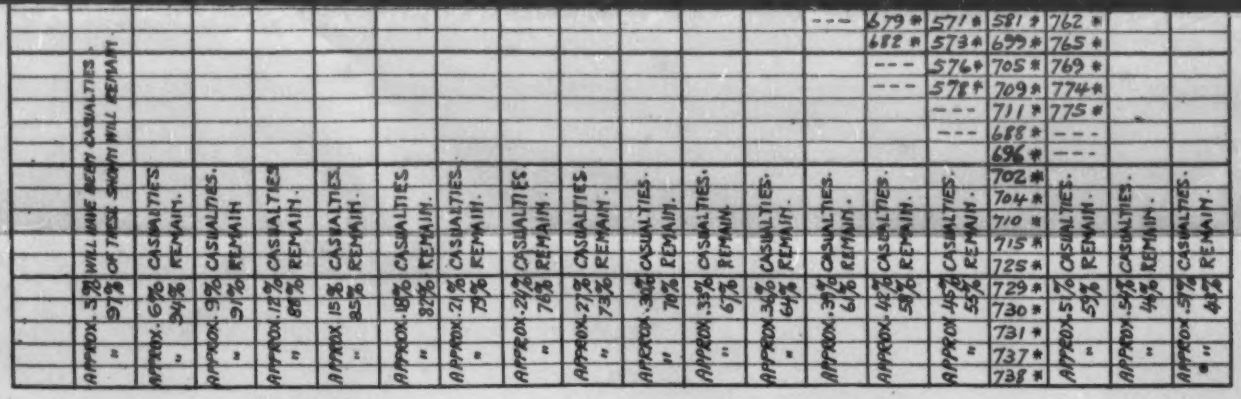
(Commander H. S. Babbitt, 23 January, 1923)

Assumptions

A. Vacancies to be selected for each year to be as indicated under the respective dates.
B. Casualties (death, resignations, retirements other than by age in grade) to be 3% per year.

1-JULY 1923	1-JULY 1924	1-JULY 1925	1-JULY 1926	1-JULY 1927	1-JULY 1928	1-JULY 1929	1-JULY 1930	1-JULY 1931	1-JULY 1932	1-JULY 1933	1-JULY 1934	1-JULY 1935	1-JULY 1936	1-JULY 1937	1-JULY 1938	1-JULY 1939	1-JULY 1940	1-JULY 1941	1-JULY 1942
4 0/4	8 0/8	6 1/7	6 1/7	10 2/12	3 0/3	5 1/6	9 3/12	6 2/8	8 4/12	7 4/11	9 4/13	9 5/14	9 6/15	9 7/16	9 8/17	(18)	(19)	(20)	(21)
ASSUMED VACANCIES / ALLOWED CASUALTIES	ASSUMED VACANCIES / ALLOWED CASUALTIES	ASSUMED VACANCIES / ALLOWED CASUALTIES	ASSUMED VACANCIES / ALLOWED CASUALTIES	ASSUMED VACANCIES / ALLOWED CASUALTIES	ASSUMED VACANCIES / ALLOWED CASUALTIES	ASSUMED VACANCIES / ALLOWED CASUALTIES	ASSUMED VACANCIES / ALLOWED CASUALTIES	ASSUMED VACANCIES / ALLOWED CASUALTIES	ASSUMED VACANCIES / ALLOWED CASUALTIES	ASSUMED VACANCIES / ALLOWED CASUALTIES	ASSUMED VACANCIES / ALLOWED CASUALTIES	ASSUMED VACANCIES / ALLOWED CASUALTIES	ASSUMED VACANCIES / ALLOWED CASUALTIES	ASSUMED VACANCIES / ALLOWED CASUALTIES	ASSUMED VACANCIES / ALLOWED CASUALTIES				
																			508*
																			523*
																			545*
																			546*
																		456*	564*
																		481*	579*
																		508	580*
																418		517*	582*
																426*	418*	518*	700*
																429*	451*	519*	707*
																433*	452*	523	708*
																443*	456	528*	692*
														314*		444*	476*	530*	712*
											184	184*		321*	357*	451	481	545	713*
											187*	205*		335*	384*	452	486*	546	728*
											199*	212*	279*	357	393*	453*	490*	547*	739*
										165*	205	218*	314	358*	399*	454*	496*	551*	741*
										180*	207*	279	317*	360*	401*	456	503*	556*	749*
								138*		184	212	285*	321	369*	440*	457*	508	562*	755*
								142*	161*	187	218	286*	333*	379*	418	469*	513*	564	761
					98*			144*	165	192*	223*	290*	335	384	426	470*	515*	566*	763*
					105*			153*	166*	195*	224*	291*	337*	385*	429	473*	517	579	766*
			79		107*			154*	171*	197*	226*	294*	344*	390*	431*	476	518	580	----
			80*		110			155*	173*	199	228*	312*	346*	393	432*	481	519	582	----
		69*	82*		112*			161	174*	201*	230*	314	348*	399	433	486	522*	584*	----
		77*	83*		113	110*	126*	162*	180	205	231*	315*	355*	401	440*	487*	523	700	----
		79	84*	79*	115*	113*	135*	163*	184	207	233*	317	357	402*	443	490	524*	707	----
		80	87*	88*	119*	125*	138	164*	186*	212	279	320*	358	404*	444	491*	525*	708	----

			[illegible]		[illegible]			[illegible]	[illegible]	199	228*	312*	346*	393	432*	481	519	582	----
		69*	82*		112*			161	174*	201*	230*	314	348*	399	433	486	522*	584*	----
		77*	83*		113	110*	126*	162*	180	205	231*	315*	355*	401	440*	487*	523	700	----
		79	84*	79*	115*	113*	135*	163*	184	207	233*	317	357	402*	443	490	524*	707	----
		80	87*	88*	119*	125*	138	164*	186*	212	279	320*	358	404*	444	491*	525*	708	----
		81*	88	95*	123*	126	142	165	187	218	283*	321	360	406*	445*	492*	526	692	----
		82	89*	98	125	131*	144	166	188*	220*	285	323*	362*	408*	450*	493*	528	712	
	65*	83	90*	100*	126	133*	145*	170*	192	222*	286	326*	366*	409*	451	495*	529*	713	
61*	69	84	92*	104*	130*	135	147*	171	194*	223	290	327*	368*	410	452	496	530	722*	
63*	76*	85*	95	105	131	138	153	173	195	224	291	332*	369	413*	453	498*	545	724*	
65	77	86*	96*	106*	133	139*	154	174	196*	226	292*	333	373*	418	454	503	546	726*	
67*	78*	87	97*	107	135	140*	155	180	197	227*	293*	335	374*	419*	456	504*	547	728	
69	79	88	98	110	138	141*	156*	181*	199	228	294	337	379	422*	457	505*	551	733*	
76	80	89	99*	111*	139	142	158*	183*	201	230	304*	338*	384	423*	458*	506*	553*	739	
77	81	90	100	112	140	143*	161	184	202*	231	309*	342*	385	426	465*	508	554*	740*	
78	82	92	104	113	141	144	162	186	203*	233	310*	344	388*	429	468*	512*	556	741	
79	83	94*	105	115	142	145	163	187	205	279	312	346	390	431	469	513	560*	749	
80	84	95	106	119	143	147	164	188	207	280*	313*	348	393	432	470	514*	561*	755	
81	85	96	107	123	144	148*	165	189*	208*	283	314	350*	394*	433	473	515	562	761	
82	86	97	110	125	145	149*	166	190*	209*	285	315	353*	399	438*	476	516*	564	763	
83	87	98	111	126	146*	150*	167*	191*	210*	286	317	355	401	440	481	517	566	766	
84	88	99	112	127*	147	152*	168*	192	212	287*	318*	356*	402	442*	483*	518	569*	768*	
85	89	100	113	130	148	153	170	193*	213*	288*	320	357	403*	443	486	519	570*	770*	
86	90	101*	115	131	149	154	171	194	214*	290	321	358	404	444	487	520*	577*	772*	
87	91*	102*	116*	133	150	155	173	195	215*	291	323	359*	406	445	488*	521*	579	776*	
88	92	103*	118*	135	152	156	174	196	217*	292	326	360	407*	450	490	522	580	777*	
	93*	109*	122*			157*	175*	200*	221*	295*	328*	363*	411*	459*	494*	527*	583*	----	
	120*	114*	124*			159*	178*	204*	225*	305*	339*	364*	412*	460*	500*	531*	691*	----	
			134*			160*	185*	216*	234*	307*	340*	365*	414*	462*	502*	532*	718*	----	
						169*	211*	219*	236*	316*	349*	386*	415*	463*	509*	533*	720*	----	
						172*	274*	229*	278*	289*	351*	389*	434*	466*	511*	538*	727*		
						177*	276*	282*	300*	322*	352*	392*	435*	467*	535*	541*	734*		
						179*	330*	302*	301*	324*	354*	395*	436*	478*	537*	543*	735*		
						182*	430*	325*	303*	336*	361*	396*	437*	479*	539*	544*	746*		
						232*		331*	273*	341*	367*	397*	441*	484*	540*	548*	748*		
						380*		417*	284*	345*	370*	398*	446*	497*	542*	549*	750*		
									306*	347*	371*	400*	464*	499*	550*	555*	751*		
									329*	447*	375*	405*	474*	507*	552*	558*	756*		
									334*		378*		475*	510*	557*	559*	757*		
									381*		383*		482*	534*	565*	563*	758*		
									448*				----	536*	568*	575*	760*		
													---	679*	571*	581*	762*		
														682*	573*	699*	765*		
														---	576*	705*	769*		
														---	578*	709*	774*		
															---	711*	775*		
															---	688*	---		
																696*	---		
	HAVE BEEN CASUALTIES. THESE SHOWN WILL REMAIN	ALTIES. AIN.	ALTIES. AIN.	ALTIES. AIN.	ALTIES. AIN.	ALTIES. AIN.	ALTIES. AIN.	ALTIES. AIN.	ALTIES. AIN.	ALTIES. AIN.	ALTIES. AIN.	ALTIES. AIN.	ALTIES. AIN.	ALTIES. AIN.	ALTIES. AIN.	702* 704* 710*	ALTIES. AIN.	ALTIES. AIN.	ALTIES. AIN.



EXPLANATORY NOTES.

1. The numbers down to the lower (dot and dash straight) line include what will be approx. the remaining 15 senior numbers each year.
2. The numbers above the upper (dotted ladder) line approx., will have already been promoted, if by seniority; i. e., this line will be approx. top of list, if none have been passed over.
3. The medial (vibrating solid) line represents approx. lower limit of selections each year, if by seniority; if otherwise, selections should go lower.
4. The asterisks indicate numbers which will reach age of 56 during that succeeding fiscal year.
5. All numbers as per January 1922 register; extra numbers are omitted.

EXAMPLE 1.

(a) The first 15 numbers on the captain's list on 1 July, 1930, will probably be included in the present numbers as shown under 1 July, 1930; i. e., in the numbers 126*, 135*, 138, 142, 144, 145*, 147*, 153, 154, 155, 156*, 158*, 161, 162, 163, 164, 165, 166, 167*, 168*, 170, 171, 173, 174.

(b) Of these, those above the upper (dotted) ladder line, i. e., 126*, 135, 138,—should have already previously been promoted, if by seniority; the nearest remaining numbers just below the upper dotted ladder line, i.e., 142, 144, or 145*—will therefore be the approx. top of list.

(c) It is estimated there will be 9 vacancies during year following 1 July, 1930; and that only 79% of those now on list will then remain; 9 is approx. 79% of 12; these selections of the July 1930 board will therefore extend through approx. 12 of the present numbers, and hence down to approx. the medial (vibrating, solid) line,—provided selections are by seniority; if selections otherwise, they will extend further.

(d) All the numbers marked with asterisks in the 1930 column will reach age of 56 during that succeeding fiscal year; and those numbers below the lower straight dot and dash line are numbers below the surviving senior approx. 15, which will also reach age of 56.

(e) Only approx. 79% of those shown in the 1930 column will then still be on list, with normal casualties, etc.

EXAMPLE 2.

(a) Number 164 will be near the lower limit of selections (just under the medial solid line) of the July 1930 board, if these are by seniority; if the selections are not by seniority, he will be above the lower limit of the selections.

(b) If remaining on the captains' list in 1931, No. 164 should be approx. at top of same.

(c) No. 164 should make his number as rear admiral in approx. the spring or summer of 1931; and the asterisk there indicates he will reach age of 56 during the fiscal year beginning 1 July 1931.

CONCLUSIONS.

(a) Those numbers above the upper dotted ladder line have a chance to be within a number of seniors equal to the number of selections, for at least 2 years and sometimes for three; they are particularly advantageously placed,—as regards seniority position and otherwise.

(b) The numbers above the medial solid line are well situated for selection; while those below this line are less favorably situated.

(c) The numbers below the straight dot and dash line have but slight chance of selection, unless the board does considerable "reaching" and many are passed over.

A PROPOSED MODIFICATION, AND A PROPOSED PALLIATIVE, FOR THE PERSONNEL SELECTION LAW

By Commander H. S. Babbitt, U. S. Navy

REFERRING to Commander McCain's instructive article, "A Personnel Survey," in the January, 1923, *Proceedings*, it is to be noted that he estimates the vacancies for promotions from captain to rear admiral as follows for the next few years:

Fiscal year ending	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	thereafter annually
Estimated vacancies	4	8	6	6	10	3	5	9	6	8	7	9

Taking the average casualties (deaths, resignations, retirements other than by age in grade) in captains' list as three per cent per year, it is found that in seventeen years the total casualties will have mounted to 51 per cent; and that hence seventeen years from now, i. e., in 1940, a number (9 say) of then surviving captains will represent what is left of approximately twice as many (eighteen in this case) of the numbers on present officers' list. To give a number x surviving captains after any other assumed y number of elapsed years, there should be taken $\frac{100x}{(100-3y)}$ of the numbers now on the officers' list. Proceeding thus with Commander McCain's estimated vacancies, the following table is obtained:

Fiscal year *beginning*	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942
Estimated vacancies	4	8	6	6	10	3	5	9	6	8	7	9	9	9	9	9	9	9	9	9
Casualties for same	0	0	1	1	2	0	1	3	2	4	4	4	5	6	7	8	9	10	11	12
Number of officers of present list to be considered	4	8	7	7	12	3	6	12	8	12	11	13	14	15	16	17	18	19	20	21

Applying the lower line of numbers from this table to the present list of captains and commanders (January, 1922, *Register*), excluding extra numbers, Chart 1 herewith is obtained. Chart 2 is similar table for commanders to captain, but calculated on a

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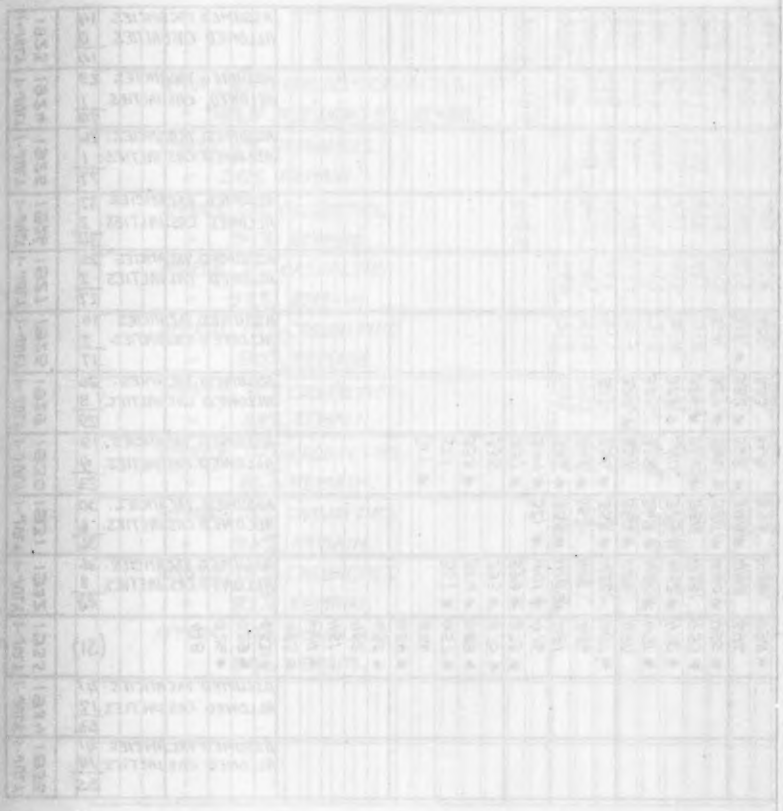
basis of 2 per cent casualties per year $\frac{100x}{(100-2y)}$ and hence with numbers as follows:

Fiscal year *beginning*	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935
Estimated vacancies	14	23	26	32	25	15	26	19	30	36	22	41	41
Casualties for vacancies	0	1	1	2	2	2	3	4	6	8	9	12	14
Number of officers of present list to be considered	14	24	27	34	27	17	29	23	36	44	31	53	55

From Charts 1 and 2 thus constructed may be clearly seen what difficulties in choices will confront the Selection Boards within a few years; and this is particularly evidenced in the captains' lists (Chart 1). Considering the latter, beginning with 1929 there will be more forced retirements than selections; and this preponderance will continually mount each succeeding year thereafter, certainly for the subsequent ten years at least (1929-39 inclusive).

This means that either many officers (near and below the lower straight dot-and-dash line) will have to be retired in grade without having had more than a bare chance of selection, if the present elimination of selection by seniority should continue; or that a continually mounting number (around and above the medial vibrating solid line) will have to be passed over each year, if a more extended selection through a greater range should later be reached; or—and probably—it means both. The result will be that the top of the list will then include many officers who have been passed over, and who are marking time (literally) somewhat resentfully, waiting for their age in grade to be reached; and that the lower part of the list will include many officers who are likewise marking time—rather hopelessly on account of their unfavorable position—also waiting for their age in grade to be reached.

Both these features are objectionable. The continued retention in active service, until they later reach the age of forced retirement, of officers who have been passed over, is embarrassing and awkward to the latter and to those selected alike, as regards their subsequent service relations. The forced remaining in active service, possibly simply waiting for the retirement age to arrive, of those with but slight chance (by reason of their



	Approx. 2% will have been casualties. 98% of these shown will remain.	Approx. 4% casualties. 96% remain.	Approx. 6% casualties. 94% remain.	Approx. 8% casualties. 92% remain.	Approx. 10% casualties. 90% remain.	Approx. 12% casualties. 88% remain.	Approx. 14% casualties. 86% remain.	Approx. 16% casualties. 84% remain.	Approx. 18% casualties. 82% remain.	Approx. 20% casualties. 80% remain.
274	328	355	390	437	473	496	528	553	692	763
276	329	356	392	438	474	497	529	554	696	764*
284	330*	357	393	440	475	498	530	555	702	765
289	331	358	394	441	476	499	533	556	704	766
302	332	359	395	442	478	500	532	557	710	767*
306	333	360	396	443	479	502	533	558	712	768
317	334	361	397	444	481	503	534	559	713	769
318	335	362	398	445	482	504	535	560	715	770
320	336	363	399	446	483	505	536	561	718	772
321	337	364	400	447*	484	506	537	562	720	773*
322	338	365	401	450	486	507	538	563	722	774
323	339	366	402	451	487	508	539	564	724	775
324	340	367	403	452	488	509	540	565	725	776
325	341	368	404	453	490	510	541	566	726	777
326	342	369	405	454	491	511	542	568	727	---
327	344	370	406	456	492	512	543	569	728	---
328	345	371	407	457	493	513	544	570	729	---
329	346	373	408	458	494	514	545	571	730	
331	347	374	409	459	495	515	546	573	731	
332	348	375	410	460	496	576	547	575	733	
333	349	378	411	462	497	517	548	576	734	
334	350	379	412	463	498	518	549	577	735	
335	351	381	413	464	499	519	550	578	737	
336.	352	383	414	465	500	520	551	579	738	
337	353	385	415	466	502	521	552	580	739	
338	354	386	418	467	503	522	553	581	740	
339	355	388	419	468	504	523	554	582	741	
340	356	389	422	469	505	524	555	583	742	
341	357	390	426	470	506	525	556	584	743	
342	358	392	429	473	507	526	557	699	746	
344	359	393	431	474	508	527	558	700	747	
345	360	394	432	475	509	528	559	705	748	
346	361	395	433	476	510	529	560	707	749	
347	362	396	434	478	511	530	561	708	750	
348	363	397	435	479	512	531	562	709	751	
349	364	398	436	481	513	532	563	711	752	
350	365	399	437	482	514	533	564	679*	753	
351	366	400	438	483	515	534	[illegible]	682*	754	
352	367	401	440	484	516	535	566	688	755	
353	368	402	441	486	517	536	568	691	756	
354	369	403	442	487	518	537	569	692	757	
355	370	404	443	488	519	538	570	696	758	
380*	430*	417*	448*							

EXPLANATORY.

1. The numbers down to the dot-and-dash straight line at bottom, include what should be the remaining approx. first 40 to 50 senior numbers each year.
2. The numbers above the dotted ladder line, approx., will have already been promoted, if by seniority; i. e., this line line should be approx. top of actual remaining list, if none have been passed over.
3. The medial solid vibrating line represents approx. lower limit of selections each year

lower.

4. The asterisks i
succeeding fisc

5. All numbers a

EXAMPLE I.

(a) On 1 July 19

Chart 2. Commanders To Captain

(Commander H. S. Babbitt, 23 January, 1923)

Assumptions
- A. Vacancies to be selected for each year to be as indicated under the respective dates.
- B. Casualties (death, resignations, retirements other than by age in grade) to be 2% per year.

tions each year, if by seniority; if otherwise, the selections should go lower.

The asterisks indicate numbers which will reach age of 50 during that succeeding fiscal year.

All numbers as per January 1922 register; extra numbers omitted.

EXAMPLE 1.

(a) On 1 July 1929, all the numbers down to and including approx. 479, should have already been previously promoted, if by seniority; and number 481 approx. should be about actual top of remaining list.

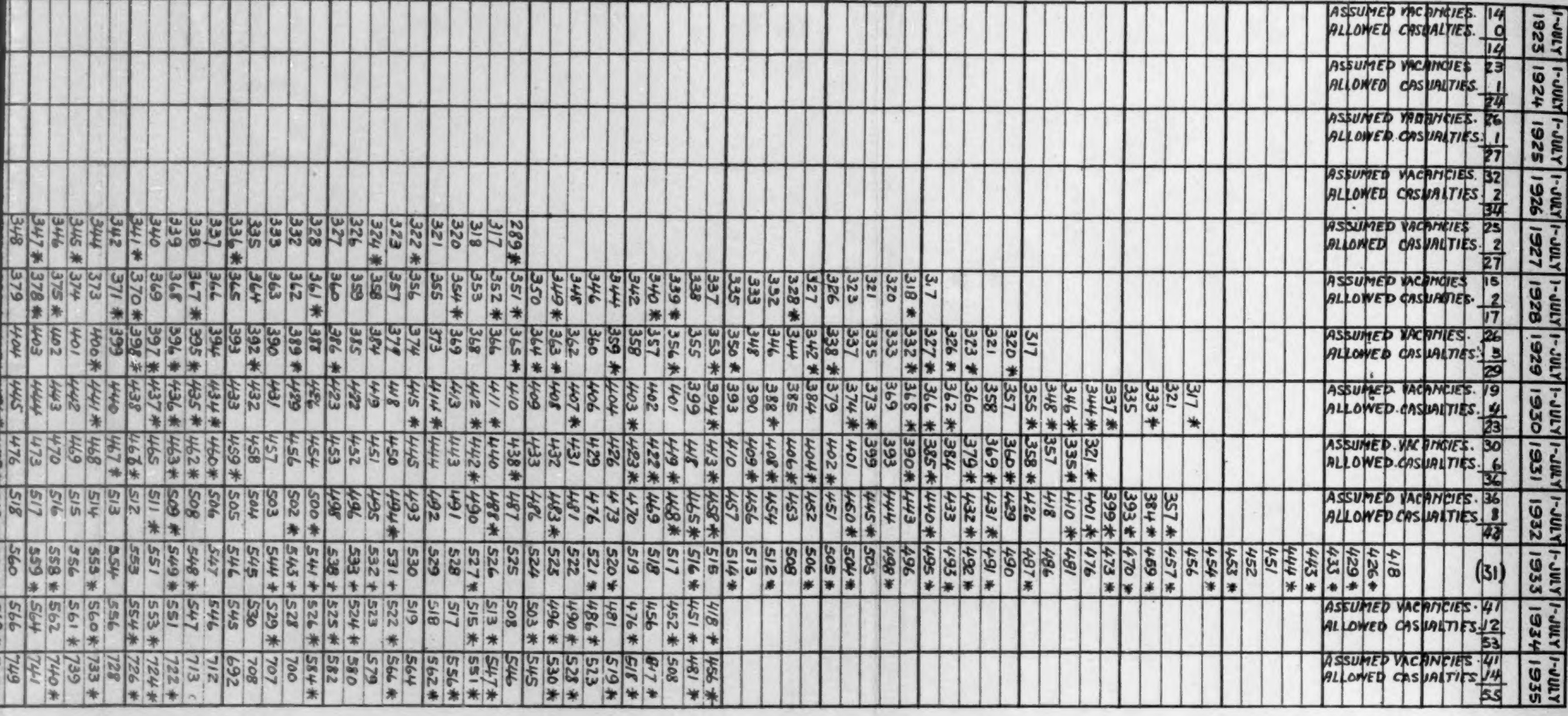
(b) That July it is assumed there will be 26 selections (allowing 3 for casualties,—2% per year—29 of the present numbers are considered); and these should go down to and including approx. 512.

(c) The numbers in the 1929 column, marked with asterisks, will reach age of 50 during that succeeding fiscal year.

EXAMPLE 2.

(a) No. 513, just under th will be near lower limi otherwise, he will be

(b) No. 513, if still a com of the list; he should m of 1930.



t under the medial solid vibrating line in 1929 column, lower limit of selections that year, if by seniority; if will be above the lower limit.

still a commander in July 1930, should be near the top should make his captain's number in spring or summer

(c) No. 513 has an asterisk in the July 1934 column; he will reach age of 50 in that succeeding fiscal year.

CONCLUSIONS.

1. Nearly all officers on present commanders' list will have full opportunity of selection for captain.
2. (Compare Chart 1.) Only a small proportion of present commanders will have a chance to reach rear-admiral's grade; and this becomes particularly the case in approx. 1939.

unfavorable position on the list, or on other account) of selection, is likewise not conducive to greatest efficiency; and it may also tend to work individual hardships on some of such officers. The following are offered as respectively a proposed modification of the present law to eliminate the former feature, and a proposed additional act as a palliative to the latter feature.

Proposed Modification in Present Act

(1.) "Any officer who is passed over in the selections by a Selective Board convened and operating as prescribed under this Act, shall, upon approval of such selections by the President, be at once detached from active service, and be retired, irrespective of age, with pay of two and one-half per centum, per annum of service, of his last total pay on the active list."

Proposed Additional Palliative Act

(2.) "Any officer who shall have completed ten years service in the grade of senior lieutenant or a higher grade inclusive, or who shall have completed twenty years total service, shall be permitted to retire upon his own application, within the discretion of the President, with pay of two and one-half per centum, per annum of service, of his last total pay on the active list."

PLANNING AND ESTIMATING NAVY YARDS

By Captain George H. Rock (CC), U. S. Navy

THE success of a manager in a navy yard for the cycle commencing with July 1, 1921, is likely to be measured by the Department's opinion of the results accomplished (a) in reducing costs and (b) in getting work finished on time. This order, it will be noted, would be reversed in time of emergency.

The most important section of the manager's organization, the one having the greatest influence on these results, is the Planning and Estimating Section. Properly organized and directed, the Planning and Estimating Section is necessary to efficiency. The combination, planning and estimating, is a logical one. The navy yards must submit estimates for much of the work for the necessary information of the Department before the work is ordered, and also some work which is being handled on a competitive basis just as private plants submit bids. The navy yard estimate is a statement of an amount it is decided the work should cost and the private plant bid is the amount for which the work will be undertaken and may be an estimate of the actual cost or it may include a profit, etc., depending on circumstances.

An estimate is either (1) planned or (2) approximate. For a planned estimate the job is investigated in detail and a plan of the work is prepared, this plan being made use of later by the planning section. An approximate estimate is not a planned estimate and may be based on data which has been collected covering similar work on other ships, or at previous times. Such a collection of data should include, also, standard estimates which have been made for such standard articles as have been made, these standard estimates being revised and added to from time to time.

Definite progress along the line of establishing an estimating section, or a planning and estimating section, was evident at nearly the same time, about 1909-10, in the navy yards at Mare

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Island, Puget Sound, and Boston. These steps were taken independently so far as the Boston yard was concerned and probably also as concerns the two West Coast yards. Since that time planning the work in a navy yard has been in and out of favor—mostly out—and at the present time cannot be said to be enjoying a promising look-in. There is no better example of the fact that experience must be acquired and cannot be passed along to a beginner. The complications in this particular case, however, are special. There is no continuity in the officer personnel, nor in the organization of navy yards, and the satisfactory installation of a planning section requires, above everything else, that steps be taken only after enough investigation to be certain of the principle involved and thus ensure that steady progress which cannot possibly be obtained with changes, certainly with frequent changes, in management. Changes in navy yard organization could hardly have been more frequent and more radical than since about 1909, when the introduction of modern management methods in navy yards was first seriously studied and undertaken.

Before that time, when estimates had to be prepared, the methods in use were not worth much and the estimates were of corresponding value. At the best an estimate was simply a guess and based entirely on such incomplete records as had been kept of estimates made and costs reported on more or less similar earlier jobs. There can be no better data than similar cost figures; but the way costs were kept and charges were made in the early days made the data valueless for comparisons. Even if all charges had been accurately made and recorded there were no operation costs recorded—only total job order costs. The master workmen or foremen made the estimates on short notice, that is they actually spent very little time on them, and added a percentage which they thought would make the totals large enough. The officer in charge of the preparation of the estimates would accept the figures handed in or he would add his percentages based on his experience with the individual foremen.

The estimates were not estimates but guesses at probable costs prepared by men whose primary interest was to see that the figures were made large enough. The master workmen were accustomed to doing all sorts of additional jobs for the ships

and it was easy if there were some catch-all estimates with enough margin to stand the charges. There has always been an aversion on the part of ship's officers to putting in writing requests for items of work on a ship undergoing overhaul which have been thought of after the original list was sent in. Often the head of the department on the ship who wants the item does not desire to convince his commanding officer of the necessity nor to explain why it was forgotten originally; often other generally similar reasons apply. Therefore the yard representative in charge of the work is approached. If he is hard-hearted other efforts are made until finally the necessary persuasion or pressure is brought to bear and the item is ordered. According to the way work was handled this was done by selecting the most appropriate job order number to which the charges could be made. The new item usually had no connection whatever with the item covered by the job order to which it was finally charged, and such new items undertaken without special authority during the progress of the work and which the estimates did not cover, often amounted to a large percentage of the total cost of overhaul on the vessel.

The estimates finally submitted were a joke so far as being accurate estimates was concerned. Yet there are officers today, and in positions of high responsibility, who say that is the way to prepare estimates—to abolish the planners and estimators and to return to the former methods, inaccurate and unreliable as they were.

Even if the total costs as finally reported covering the overhaul of a vessel, agreed fairly well with the estimates as submitted, that was no proof of accuracy of estimates. Unfortunately, but as was well known, it was usually a proof that the masters had been keeping cost records on the jobs. Accurate charges are most difficult to obtain at any time—the cost returns now of any job of reasonable size will be found on analysis to contain many errors, many of them large ones. Accuracy in those days meant even less. To constantly scrutinize the returns in the effort to keep the charges reliably accurate meant a great deal of arduous, tedious office work combined with a very accurate and complete knowledge of the status of each job, and the study of the detail cost returns had to be kept up-to-date

or it would not result in necessary corrections, and such returns would not be worth much. The result was that they were not studied and watched in that way—there was not time, and it was not even possible except for a very few special jobs.

The experience as to inaccuracies in charge against job orders is not confined to navy yards. The conditions and results are similar in private yards. Some contractors issue special job orders to cover changes, or jobs for which they intend to submit claims for extra compensation as changes from the contract plans and specifications. These cost returns in the past on Government vessels (in some yards) have been open to the Board on Changes and the detail charges have been furnished daily—say the second day after the work was performed—to the resident inspector (officer) who kept the data for the Board. The inaccuracies constantly present in such charges are naturally very similar to those in navy yard returns. The very nature of the thing ensures such inaccuracies. Job order numbers are complicated; supervisors or mechanics who make out the time chits have other exacting duties which demand their time, and often have dirty hands and a stubby pencil with which to make their entries; figures and letters are not made accurately and legibly; and are easily read incorrectly; often accountants know little, if anything, about the work and they add to the errors by making other errors in transcribing from the time chits; and it means nothing to many clerks in the accounting office that a boilermaker is being put down in the final charges as working on the installation of a toilet in a bathroom or a sailmaker on the job of patching a bulkhead or a boiler. Indeed many wrong charges, even, sound plausible enough as many trades can be involved in many jobs and the possibility of error lurks in every charge. Real familarity with the job is essential before the charges against it, for labor and for materials, can be studied and errors detected. When so many jobs are involved, the time for such study is not available. The officer handling the work can only expect to strike the high spots on certain jobs. There are not enough of us to go around in these days of shortage of officers, to have officers assigned who are able by experience to handle the work. Maybe the balance sheets average up in the long run—the total charge against a ship on which $100,000 has

been spent may not be out over one per cent due to such errors; but the individual job orders are out very much more—and formerly the total charge against a particular vessel meant at the most that the total of this amount handed in against her might be approximately correct, although the list of the items of work done probably was not very complete. When the cost returns were made up no one knew much about them. Some knew from long experience, that they probably were very inaccurate. The outstanding requirement was that if the cost exceeded the estimate by a certain percentage, an explanation was required. The returned costs of job orders after completion of work on a ship was often a remarkable paper. The very large percentage of jobs for which the final costs were within the allowed tolerance of the estimated costs was very striking. Even so there were always explanations necessary and the total cost very frequently exceeded the total estimated amounts by very large figures. This is not surprising in view of the way estimates were made and job orders handled. The wonder is not that the final costs differ so much from the estimates. The wonder is why and how the estimates are so close. Will a man who made an estimate on work he is to do ever estimate too low or miss his estimate very far? Greatly overrun estimates could usually be traced to loading up the job with unrecorded extras. The estimate has to be made for many assumed conditions; such as the kind and amount of work in the yard; the location of the ship during the time the work is done; the particular supervisor, particular men, and the particular ship superintendent whom it is possible to place on the job; the conditions of weather; the number of times when the work has to be stopped on account of more urgent work for the particular gangs employed elsewhere in the yard, or on account of lack of funds, etc.; and other generally similar conditions, all of which affect final costs.

The estimate has to provide for all of these, and is now based, as much as possible, on returns of costs of operations, which are few indeed, in regard to most jobs. The accounting offices have not been able to furnish many cost returns, and those data therefore, in the planning sections are far from complete. The yards are prohibited by law from making studies—that is, time studies and the like—of jobs in progress, and therefore are un-

able to fix on satisfactory actual costs for standard operations, many of which otherwise could be collected and used in future estimates, and which would make them just that much more accurate. Also, as the work progresses, there must be numerous places where advantageous changes in the original plan are found to be possible, and many of them are made. There is not time, and in fact, often it is considered to be too much bother to issue revised or supplemental job order specifications and to make a revised estimate to suit each such change in detail. That should be done, but practically it often will not be done. The result of all these numerous things which affect the actual cost may make it differ widely from the estimated cost, and it would be strange, indeed, if it did not. Such cost data could not be much help later in preparing estimates for a lot of generally similar jobs of projected work on the same or a different vessel. The cost in 1893 of overhauling the anchor engine and anchor gear on the *Chicago* would not necessarily bear any special relation to an exactly similar worded order in 1895 on the *Baltimore*. The actual recorded cost of each job might well have been within fifteen per cent of $750.00; but that does not mean it was satisfactory practice to put in an estimate of $750.00 on that item on the *Baltimore* because the records showed that cost on the similar item two years earlier on the *Chicago*. It would be a coincidence, only, if the two costs were even approximately the same. It would be a much more likely guess simply on account of the nature of the work involved, to estimate on a bottom repair job on the *Baltimore* in 1895 at say, $300.00 for each bottom plate requiring renewal because a generally similar bottom job cost that approximate figure two years earlier on the *Chicago*, and yet comparisons of such apparently exactly similar jobs in different years but in the same yard, show the costs differ by 100 per cent. Such methods, however, are simply on the principle of accepting the estimate brought down by shooting into the flock of conditions surrounding a similar subject at some former time. Formerly some of the master workmen kept some returned cost figures of this kind; but most of them did not. They had no special place to keep such papers, and had to file and index them themselves, as no shop clerks were allowed until comparatively recently. Some

officers kept copies of cost reports and the office files usually were full of them; but as a matter of fact such cost figures actually were not used much in preparing estimates covering similar subjects. Possibly this was because it has always been recognized that the similar sounding jobs would be very different in the final analysis, and it was known also, that charges against jobs had not been scrutinized very carefully and the final cost figures therefore, probably were very inaccurate. It was much too common an experience to be exceptional for the cost figures on a particular ship on which extensive alterations were being made, to be two or even three times the estimate.

The need of some better way of preparing estimates was obvious and the recognition of the principle that estimates are not primarily a function of men whose job is to produce work cheaply, quickly, and efficiently. The establishment of estimating sections in different yards followed. This estimating section, whenever practicable, was under the control of an experienced officer and included supervisor mechanics, expert mechanics from different shops, draftsmen, and clerks. The number in the section necessarily fluctuated with the volume of work.

The mechanics were drawn into the section from the different shops on nomination of masters and when the volume of work fell off, the corresponding numbers were returned to the shops. The total number constantly fluctuated to suit the work. The section was composed largely of the men who formerly had done the same kind of work directly for the individual masters and had done that work in the masters' offices. The time-spent formerly by them on such estimating work in the shops depended on many conditions, and the planning work not done by them under those conditions was mostly turned over to the workman on the job to do in the best way he could. The only records which were available in these shop offices were such as the master workmen had managed to gather together for their own records. As a rule such records were neither very complete, nor kept in a very orderly manner, because no competent persons were allowed for that purpose, so that the real value of such records was small. A central estimating section, however, would be fitted out suitably with necessary facilities, files, etc., and with all the cost data possible to collect together. These records

would be filed so as to be immediately accessible and available for all. The officer in charge of the section would be responsible for the collection of cost figures from accounting office, and for having them analyzed and filed away for later reference. The drafting room is alongside, from which all necessary plans and calculations are obtained. The members of the section are assigned to work according to their particular experience and qualifications. These men are soon trained, their work becomes more accurate, and the lost time is very greatly reduced.

Reference was made above to the close relation existing between estimating and planning, and to the unit of the organization now existing in some yards and which has at different times existed in all yards, known as the Planning and Estimating Section. While the preceding has necessarily connected them in some of the references, it has dealt more particularly with the estimating end. The following similarly deals more specifically, although for many reasons only very generally, with the planning end.

We all certainly agree that it is most desirable to have a properly worked out plan before beginning any job. Therefore no discussion is necessary as to the general necessity and value of planning. The questions are rather who will do the planning, where will they do it, and how much will they do.

Any job is divided into two operations: (1) Planning, and (2) execution. Planning is the management's part of the job; execution is the workmen's part. Therefore the management must plan out the work or pass up to the workmen part of the management's job. The management has no right to expect a full day's work from a man if he must spend half his day planning. The planning carries the job from the time of receipt of the order to the time that the workman lifts his tool to work. It consists of:

1. An analysis of the job and a division of the job into certain "machine" or "trade" operations.

2. The working out of detailed instructions covering each of these operations.

3. The routing of the work (to the machines) in the proper sequence.

4. The providing of tools, materials, and everything to work with in advance.

In other words, planning defines the job and provides the proper conditions for its efficient accomplishment.

Planning does not mean outlining today a man's duties for tomorrow. It means rather outlining the means and methods of doing a job before starting it. The decision as to the means and methods of doing a job is perhaps the most important part of its accomplishment and for this the management relies upon the knowledge and experience of the master workmen and other supervisors, and it is necessary to inspire them to exert their best efforts. Having decided on the means and methods, the remainder of the operations of planning is largely clerical and should be handled automatically by the system.

The work in a navy yard naturally divides itself into two classes:

1. Inside work, or work done in shops.

2. Outside work, or work done outside shops, on the ship or in the yard.

For the inside work, all the planning is done in the shop and there is for each shop a central routing board in the master workman's office from which the status of any job in the shop can be seen at a glance. For the outside work of the yard—which is mostly the work on the ships—we would have the unit planning board on the ship; the central planning board, for the routing and planning of the outside work, would be in the main office. The method of handling this central planning board for outside work is somewhat as follows: The job in place of being forwarded to the master's office, is forwarded to the central planning office. From here, the master workman is called into consultation (it will be understood that this does not mean the master workman is called up to the main office building—as a general practice the planner confers on the telephone and makes an appointment as to time and place to suit the condition), and the job is gone over with him, after which the route sheet is prepared in the planning office and approved by the master workman before being issued, after which the instruction cards are made out. Thus the master workmen are given direct control over the methods and means of doing the work.

It will be noted that at any time when information is desired by the master workman or any one else as to the progress of any particular class of work in the yard, it is immediately available from the planning board by consulting it for any particular trade. If the arrangement indicated does not suit the urgency of any job the force can be immediately re-distributed to meet the demands. This system places the work intimately under the control of the master workmen. It permits them to determine before starting a job the exact method to be followed in doing it and it also lifts from their shoulders much clerical work and memory work, this burden being placed on the system, thus permitting the master workmen to devote their time to the actual supervision of the job and to the instruction of the workmen. This giving of instruction and assistance to the workmen is a very important feature of the system, certainly often much neglected, and it enables the men to do the work in the best way. This is quite different from an older system, all too common, of putting a man on the job and letting him work out his own salvation. Certainly this is an important part of a supervisor's duties and one of the principal duties for which he is appointed. He must be assumed to have better knowledge of the best ways to do a job than the workman and he is given the higher pay as a supervisor so as to secure benefit of his greater experience among the workmen assigned to him. To suppose that the ordinary workman is as capable as his supervisor in devising methods and means is an acknowledgment of the inferiority of the supervisor. We are after increased output and certainly the man working under proper instructions will do a great deal more work (usually) than the man who is allowed to follow his own methods. Is it a question of methods of work or of exact instructions as to what is to be done? A properly planned job usually does not leave alternate methods to follow. A shipfitter could get out a bulkhead by templating every plate on the ship, but proper planning would require all the templating to be done from the floor (mold loft). In either case the method of preparing for fabrication and erection would be the same. Where work is not planned by those most competent to do it, the man on the job does it himself, usually with a tremendous waste of time and energy. Proper instruction

assists men to higher ratings and improves the efficiency of the entire force. Where the work is not planned the master workman spends a very large amount of his time each day answering questions of those under him as to the job to be undertaken next; the urgency of this or that job; the distribution of this or that group of men; the extent of this or that job, etc. Most of these questions asked are questions which should be answered before any work is started on a job. Not only is time wasted in asking and answering and discussing such questions, but often the master workmen cannot reach a decision then and must consult further with the drafting room or the files.

The principal criticisms heard against the planning section in a navy yard are that the cost of doing the work is increased, and the time required is longer on account of work not being started promptly. It should not be difficult to convince anyone that these arguments are altogether wrong. Certainly any work properly planned must cost less than if it is done, without such planning and has to be sort of planned as the work progresses. Surely the planning can be done more cheaply by experts who are properly trained to do that particular work, and who are given all facilities necessary to do that work quickly and accurately, than if done by former methods where it was laid out piecemeal, if at all, and the workmen assigned to the job allowed to dally along while waiting for the next piece of information, or taking time to go to the shop to find the supervisor who could explain the next step to be taken, or sitting on the job and trying to plan it out for themselves, with the result that often happened of having to change the work later because it was not planned to suit the man higher up who ought to have planned it himself. Every job carries in its costs, the cost of planning, but while the cost for planners is definite and easily obtained, it is impossible to arrive at the cost due to haphazard instructions to the workmen, and the loss of time from the man puzzling the work out for himself.

Where the planning is properly charged with delay in starting work, it is the fault of the details of the system and not at all of the principle. There is no reason whatsoever why any job, no matter what it is, cannot be started exactly as quickly in a yard where the planning section is most highly developed as it

can in that or any other yard where the planning section has been abolished or has never existed. It is not at all necessary for the workmen to wait for written instructions in order to commence the work. That is better, and should be followed where the conditions permit it; but where they do not permit, the work can be started as soon as the vessel is tied to the wharf. Jobs like the latter are exceptional and will not be many. They will be limited to the one, or perhaps two biggest jobs on the ship, and for them the immediate planning—that for the commencement of the work—can be done in person on the ship with the men, the planner and the master workman with the officer in charge of the planning of the work going to the job with the workmen who must commence the work. The job can be laid out in a few minutes, to last the balance of the day, and before that time the regular instructions can be gotten out for the succeeding step, and then it is easy to keep ahead of the workmen while complete planning of the job is being made. Criticisms that the jobs are unnecessarily delayed and take longer to perform because the work is commenced later are frequently thoughtless, and are made without taking into consideration the fact that when the job is properly planned out, the actual working time on the job will be less, and, of course, the job can start later and yet finish earlier. The actual time a job is commenced is a very intimate part of the planning. Obviously all jobs cannot be started at once. The work must be carried on to suit the force, and jobs necessarily have to be started all along the line from arrival to departure of ship. It frequently happens that this apparent delay in starting some of the jobs is the cause of criticism of the planning system, when as a matter of fact this very delay is more often than not, the result of a careful plan for the completion of all work and not letting minor items interfere with major jobs. Also, we have gotten away from the idea that often used to prevail in many yards that the cost did not mean very much anyway, and the primary object was to get the work done. The cost does mean much and does enter into the plans, and necessarily so. And it may well be that the job does actually take longer but costs less, due to the proper planning. If that result does not interefere with the departure of the vessel, and therefore does not interfere with the necessary military

arrangements involved, then the fact that the job took longer but cost less should be the occasion for commendation and not for adverse criticism.

The subject is big, and there are many points of view. It is only necessary to thoroughly understand what the planning is accomplishing for the efficiency of the yard and for the cheapness of production in order to approve it. The worst effect on the planning is the occasional abolishment of the planning section for the announced reason of improving or increasing the efficiency of the yard. That gives such a black eye to the system that it takes a long time to recover.

All that is accomplished in the naval service commencing with the instruction of recruits and midshipmen is planned, and planned in detail by people assigned that work as a major function whether it is called by that name or not. It is highly illogical to condemn the planning section for navy yards, or to cripple it, simply because figures as to what is paid for this service are segregated and easily accessible. All practical experience shows that this is the cheapest form in which this service is obtainable, but the very fact that any job handled on the hit or miss system carries extra costs all along the line renders it impossible to ever produce exact figures to prove the case.

A NAVAL POOH-BAH

By Rear Admiral J. L. Jayne, U. S. Navy, Retired

NAVAL officers of the United States are educated to perform many kinds of duties, ranging from junior deck officer or assistant engineer to commanders of battleships and fleets, and may, on occasion, be required to fill civil posts in the government or our insular dependencies. But I doubt if many other officers have filled so many different offices at the same time as fell to my lot in Samoa, soon after the United States established a naval station there.

In the summer of 1901 I was a lieutenant, serving on the U. S. S. *Philadelphia*, as watch-and-division-officer. When the *Philadelphia* went to Samoa, taking a relief crew to the *Abarenda*, the station-ship there, orders came assigning me to duty as navigator of the *Abarenda*, with additional duty as engineer officer.

When we arrived in Samoa we found the executive officer of the *Abarenda* in temporary command of her, and acting commandant of the naval station, and acting Governor of American Samoa in the absence of Captain "X," on leave in the United States. The executive officer was not in good health, and his strength would not permit him to perform so many duties, the climate being enervating, so he assigned me to relieve him as executive officer; thus I became at the same time executive officer, navigator and senior engineer officer of the *Abarenda*.

As the stations of the executive officer and navigator are often on the bridge of a man-of-war when that of the chief engineer is the engine room, particularly on entering and leaving port, the reader may ask how one man could perform those various duties at the same time. Knowing that my duties would call for me to be in two places several hundred feet apart at the same time, and that I could not divide myself so as to perform this feat, I asked the commanding officer where he wished me to go. He assigned me to take station at the engine room door. From this place I could go quickly either to the bridge or the engine

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room as required, and I could speak to men in the latter place by simply putting my head inside the door. I took this station the first time that we got under way to leave port; but the commanding officer, finding that he could not at all times know the position of the ship with reference to rocks, shoals and other hazards, without the assistance of the navigator, had me with him on the bridge after that when in the vicinity of such dangers.

After I had been performing the duties of executive officer, navigator and chief engineer for several weeks, the health of the temporary commanding officer took a bad turn and he was sent to the United States on sick leave. This automatically made me commanding officer, acting commandant and acting Governor, in addition to the three offices named above, and I acquired another office, that of the president of the High Court.

Under the organization of the government in American Samoa, as it existed at that time, the commandant was *ex-officio* president of the High Court, but while I temporarily acted as commandant I did not find it necessary to exercise the judicial functions. However, after the new commandant had taken command, he assigned me to take his place on the High Court while he busied himself with the larger affairs of government. While serving on this court I had the interesting but disagreeable experience of re-trying a white man who had been convicted by the District Court on a charge of assaulting a native woman. The most unpleasant feature of this affair was the conduct of the counsel for the defendant. His behavior suggested the shyster criminal lawyer, with a jury composed of men of the type of the defendant; and as presiding officer of the court, it became my duty to call him to order very often. He knew nothing about law, but thought he knew a great deal. He was much chagrined that the result of his efforts was that the High Court confirmed th action of the Lower Court in convicting the defendant, and increased the severity of the sentence.

During the time that I was in temporary command of the *Abarenda* and acting commandant of the naval station, a number of unusual things occurred. The first thing of note was the unexpected arrival of the commander-in-chief of the United States Pacific Station, on the Flagship *Wisconsin*. We had no idea that there was a man-of-war within two thousand miles of us, when

one morning about sunrise, the officer-of-the-deck, who was much excited, reported that an American battleship, flying the flag of a rear admiral, was entering the harbor; and in a few minutes he came back and reported that she had made a signal to prepare to go to Apia. Apia was the capital of German Samoa, and the idea immediately entered my head that we were at war with Germany, and the admiral proposed to capture Apia. This occurred about the time that President Roosevelt had the little dispute with Germany, about the Venezuelan matter, and the last papers which we had received gave the information that the President had taken a very firm stand in regard to Germany's action in Venezuela.

My surprise was quite great when I learned, on going aboard the flagship, that her errand was not of war, but to conduct a court-martial in regard to certain charges which had been preferred against Captain "X," then on leave in the United States, but due to arrive in twenty-four hours; and the admiral wished the *Abarenda* to go to Apia to get witnesses. We had no idea that a court-martial was to be held, and as the captain was a great favorite with the natives, and highly honored and respected by the officers of the *Abarenda,* who had served under him, there was great surprise.

The captain was a very able officer who had been sent out by the Navy Department to establish a naval station and Government of American Samoa. He had performed these duties to the great satisfaction of the natives, and, as far as we knew, to that of the Department, but it seemed that there was a trader in Apia who called himself an American, who was not satisfied because the Governor had not taken his advice on certain matters. His idea was not at all unselfish, and he proposed measures to the Governor which would have been very beneficial to himself, but not to the natives. The Governor was wise enough to see this, and to decline to act as advised, much to the disgust of the trader, and hence the charges.

It appears that the Governor was very popular in Apia with practically everyone but this trader and his men, so the trip of the *Abarenda* resulted in not bringing a single witness against the captain, but a letter to the admiral signed by the leading white men of Apia setting forth what a fine man he was. The admiral

had expected that the American Consul-General at Apia would be available to give evidence before the court-martial, for the prosecution, but that gentleman had died. Of course the admiral could not disband the court and call the trial off on the strength of the testimonial of the prominent citizens of Apia, as he had been sent to Samoa for the especial purpose of holding the trial and the Navy Department had gone to the expense of sending the U. S. S. *Solace* to Samoa to carry the personnel of the court, of which Rear-Admiral Robley Evans was president. Being disappointed in the result of the *Abarenda's* trip to Apia, the commander-in-chief decided to have her make a second trip and take his chief of staff to secure witnesses, and it was hoped that the son of the late Consul-General could be persuaded to appear as a witness; but this he refused to do.

Captain "X" had arrived before I left on the second trip of the *Abarenda* and he asked me to carry a letter from him to the Governor of German Samoa, asking him to appear before the court as a witness for the defense. I gladly agreed to do this, as it did not conflict with my duties, and I had a very pleasant interview with the Governor, who proved to be Dr. Solf, a man who has recently come into world prominence as German Minister of Colonies. The Governor said he had a very high regard for Captain "X," and would gladly accede to his request, but he feared his home government would not approve if he left his post to go to a foreign country on such an errand, and therefore he felt that he must decline. Consequently the trial was held without any witnesses from Apia, and resulted in an honorable acquittal for Captain "X."

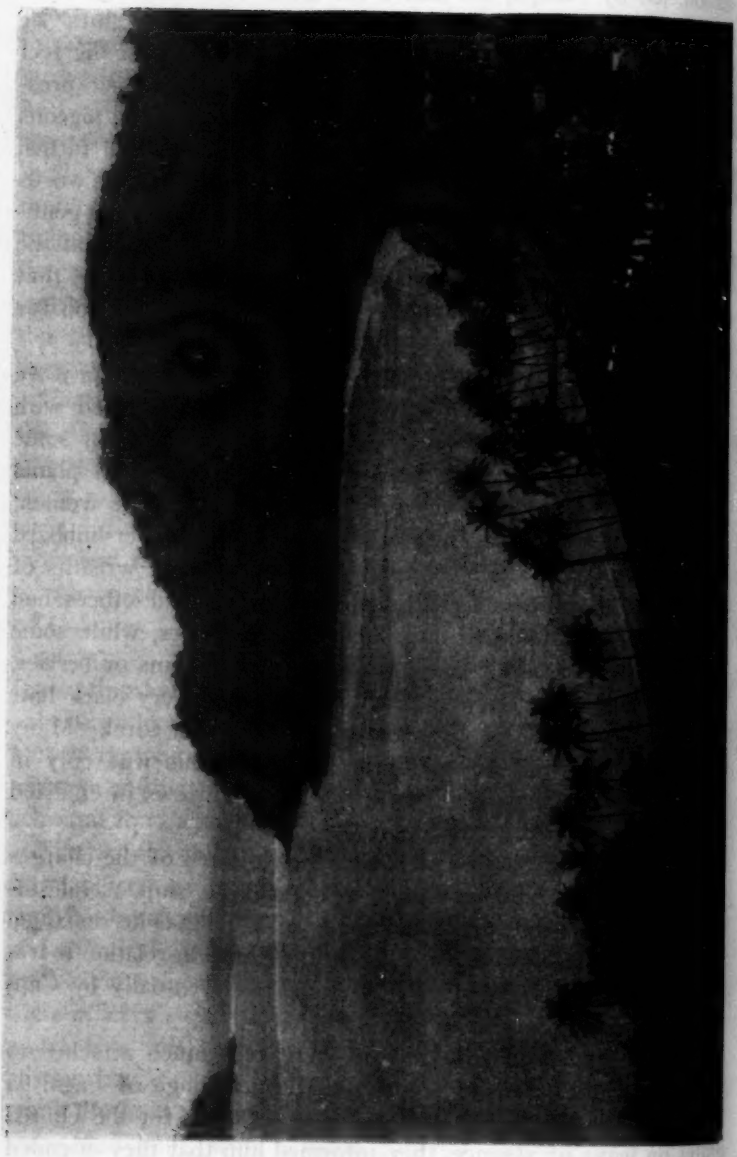
The natives of Samoa like Americans, and especially American naval officers and bluejackets, and they requested permission to give a formal greeting to the commander-in-chief of the station and Admiral Evans, and the other high officers who were assembled for the court-martial. It was accordingly arranged that these officers should assemble on the porch of the little building which was used for the headquarters of the naval station and custom house of the island. The porch looked out on an open space of about two acres in area, about which the village of Pago Pago was built, with a white concrete building, the Christian Church, near by. The natives from Pago Pago and other villages

around the bay and from all parts of the island formed in a procession, led by Mauga, the native Governor of the Eastern District of Tutuila, and passed in review, with a cordial "Talofa" or other native greeting, and almost invariably deposited at the feet of these officers, some material token of pleasure at their presence, such as a fine bunch of bananas, or fresh cocoanuts, pigeons just killed in the forest, or young chickens from the small farms. The broad smiles and cordial tones in which the native words of welcome were expressed left no room for doubt as to the genuineness of the welcome, and so numerous were the gifts that the local supply of chickens, et cetera, was so nearly exhausted that it was difficult for us on the *Abarenda* to buy sufficient food for our tables for some time.

The procession was very picturesque. Every native man wore a lava lava or loin cloth of fine tapa, richly ornamented with figures, or perhaps it was a fine mat, left as an heirloom by some ancestor, or it may have been simply leaves of tropical plants or long grass strung on a cord of cocoanut fiber. The women, however, as a rule wore their best hallacous or mother-hubbard gowns; many of them, both men and women, wore wreaths of flowers on their heads or around their necks, and others had gorgeous colored hibiscus blossoms over their ears, while some had necklaces of sharks' teeth, coral or colored beans or berries, and some had perfectly white hair, that is, their very black hair was covered with a coat of whitewash made from coral. Many of the men carried spears or war clubs, but this was only in honor of the guests as the troops at military reviews in civilized countries march with arms.

Although Captain "X" was honorably acquitted of the charges preferred against him, his duties as regards the ship, naval station and governorship, remained unofficial as long as he remained in Samoa, and I continued to perform the duties in relation thereto, which had been his, until I was relieved eventually by Captain "S."

As previously stated, the natives were very much attached to Captain "X." On his last visit to the large village of Fagaitua in the Eastern District of Tutuila, before leaving for the United States on leave of absence, they informed him that they intended building a fale or native house for his sole use, so that when he



next visited them he would have it for his own to do with as he pleased. Now that the court-martial proceedings were over they desired to present the fale to him, with due formality. Consequently I organized an expedition to go to Fagaitua, and as the trail from Pago Pago to that village was impassible for white people who wore shoes, we went by boat. We had to go outside the land-locked harbor and several miles at sea to a little cove where we could effect a landing through surf with the assistance of natives, who carried us on their backs from the boats to the sandy beach above the high water mark.

In the party were Captain "X," Mauga, the Native Governor of the district and myself, and our wives. The landing in the manner described was a thrilling experience, especially for the ladies in the party, but it was made without accident, and we were repaid for our trouble by a very entertaining experience. The entire village was en fête. All the natives were attired in their most picturesque costumes and arrayed in orderly fashion for passing in review before the official party, for which a place of honor had been provided where we were protected from the tropical sun but could see and hear all that went on under the shade of the beautifully shaped thatched roof of the fale, which was to be presented. There were orators for the occasion who told the captain and all of us how the people loved him, and what pleasure they had taken in constructing the fale for him, and how they hoped he would use it very often so as to be among them. And in making these speeches they did not forget to tell how pleased they were to greet the captain's wife and express the hope that she would favor them with her presence.

The fale was the most beautiful that I had ever seen, and gave evidence of very great care in construction. The curves of the roof were very graceful and as usual there were no nails and no metal in any form used in its construction, yet it was evident that it was so strongly put together that it could resist the strongest winds that it was likely to encounter, and keep out torrential rains. It was evident that much thought had been given to preparations for our entertainment. Special arrangements had been made for the comfort of the ladies, and the wives of the chiefs played the part of hostesses very prettily, and our appetites were satisfied by an elaborate banquet of native food in which fish played an important part.

Captain "X" thanked Leiato and his people very graciously for the honor they had done him, and expressed his regret that he would not have many opportunities of being with them as it was necessary for him to return to the United States in a few days, and he asked if, under the circumstances, he might turn the fale over to the acting governor and his wife to be passed on to their successors, so that the governors would always have an official residence in their village. This they willingly acquiesced in, and the fale was therefore turned over to me and my wife, to be passed along to our successors.

THE FITA FITA GUARD

The *Abarenda* carried as part of her crew thirty natives who were enlisted for special service and were used at the headquarters of the naval station at Pago Pago for police duty, and as a crew for the commandant's barge. These men were drilled as infantry, in the use of the service rifle, et cetera, and wore as uniform the regulation white undershirt, a red turban, and a blue lava lava trimmed with three red bands on the bottom. They were splendid physical specimens and never failed to impress strangers very favorably, especially when manning a barge. They were expert boatmen and could make a landing on a surf beach in the most approved fashion, jumping into the water up to their waists and gripping the gunwales, ease the boat through the breakers, and haul it up on the beach clear of them, and then take the passengers on their backs and carry them beyond the high water mark. They pulled a beautiful stroke and made a very dignified appearance in taking the commandant alongside a man-of-war, or pulling him about the harbor. Some of these men were native chiefs and all were men of good standing among their people. Leiato, the high chief of the large village of Fagaiture in the eastern district of Tutuila, was a petty-officer in the guard.

THE MCKINLEY ROAD

A few days after the arrival of the steamer from the United States, which brought us the news of the assassination of President McKinley, Leiato came to me and asked for leave to visit his village and informed me that his people desired to hold a

SAMOAN CHIEF WEARING WAR BONNET AND HOLDING WAR CLUB

lagi, or death feast, such as they would hold on the death of a native king, in honor of the dead president. Being informed by the Secretary of Native Affairs that a lagi consisted of a carousal and a period of feasting, dancing, et cetera, which might last several weeks, I told Leiato, that while his desire to honor the memory of the dead president was much appreciated, I did not think the proposed manner of doing it was desirable. I tried to explain how permanent memorials were erected in Europe and America and suggested that his people build a permanent memorial and one which would be useful to themselves instead of spending several weeks in idleness and feasting. I suggested that, as the trail from Pago Pago to Fagaitua was not fit for one to travel on, they build a good road and call it the McKinley Road. He was given his leave, and in due time returned and informed me that his people desired to please me, but that they still desired to have the lagi. I told him I was sorry they felt that way about it; that I would not dictate to them, but suggested that they reconsider their decision. I asked him to go home again and see what they would do. The result was that he came back in a few days and reported that they had decided to build the road. It was decided to have a little ceremony of turning the first sod in beginning the work. A point along the proposed route was selected for the purpose, and a party consisting of Captain and Mrs. "X," myself and wife and small son, and the Secretary of Native Affairs, and his wife, proceeded to the nearest point inside the harbor where a landing could be effected, and then with the assistance of the natives made our way with great difficulty along the old trail to the point where we met the native chiefs and others who had assembled for the ceremony.

When all was ready Mrs. "X" and my wife turned over several shovelfuls of earth while appropriate speeches were made by Captain "X" and two native missionaries, one representing the French Catholic Mission, and one the London Mission Society. In order to show the native point of view a translation of the address by one of these is given herewith. After the addresses one of the missionaries offered prayers and the other held a short devotional service in the Samoan language. The whole party then adjourned to the nearby village of Lauli where Leiato had prepared a feast in Samoan style, and where kava was served.

The building of this road was undertaken by the natives with considerable show of zeal as well as sorrow and respect for the martyred president.

Translation of Native Address

"For the exhortation and prayer concerning the building of this road in memory of the death of the President, William McKinley, read *Genesis* 35, ninth to twentieth verses; *Nehemiah* 2, eleventh to twentieth verses, the story of the monument erected by Jacob to commemorate the death of his beloved wife. The monument was built by Jacob as a sign of her grave. The mound on which it was built was like the 'fatutai' (a heap of stones built in a lagoon to attract fish) and placed inland, that it may remain always; that he and his wife's children and family might look upon it, and that it might be known by all people traveling to and fro on the great road to Israel, as well as the generations to come after that they might see all that had been done in the past years, and that it might extend into future generations.

"It was considered that this story would be appropriate for this occasion; that it would be useful and proper. Leiato and this district agreed to do something to commemorate the death of the President, and this was their resolution: To have a death feast and go through the customs observed on the death of honored kings and great chiefs in these islands; but this district and Leiato obeyed the desires of the commandant and the officers of the government, that they should build something substantial that would last forever, like was done by Jacob. Nehemiah was in Babylon, and serving upon the King Artaxerxes, when he heard the report about the destruction of the wall of Jerusalem. Then he begged the permission of the king to go to Jerusalem and again build up the wall which was broken down. Nehemiah reached Jerusalem. The first thing he did was to go from place to place and see the condition of the wall and to observe what work was necessary. Then a second thing was done by Nehemiah. He brought together all of the high chiefs of Israel and old people, that they should deliberate about the work to be done. When that deliberation was over there was great rejoicing and much satisfaction among the people, and they began their work with pleasure.

"The weak governments of the past are like the wall broken down; but now has come the great government of the United States of America, and Your Excellency, the Governor, came, and you saw the wrong things that existed in this country, and you made exhortations like those made by Nehemiah; and then Sua and Jaifanus and His Excellency, Leiato, responded with great pleasure—such was the pleasure of the old men of Israel."

TUTUILA'S LEGISLATIVE ASSEMBLY

While the commander-in-chief was at Pago Pago on the *Wisconsin,* the time for the annual "fono" or assembly of representatives of the natives of Tutuila to decide on the tax rate drew near, and thinking that the Assembly might interest him, and that his presence thereat would lend dignity to the occasion, I asked him to remain for it. He found that he could not remain, however. While regretting the loss of prestige which I felt his presence would lend to a proposal which I intended making to the representatives, I decided to hold the Assembly at the appointed time and place in accordance with the Proclamation which I had issued, and accordingly I proceeded to the meeting accompanied only by the Secretary of Native Affairs, who was also my interpreter.

The place of meeting was a large village near the boundary between the two districts of Tutuila, several miles from Pago Pago. The trip had to be made by boat and by native carriers where the trail was impassable to men who wore shoes. The natives' feet were as tough as sole leather and their toes were developed so that they could cling to surfaces on which shoes would slip.

The assembly was held in the central square of the village. The delegates from the eastern end of the island were drawn up in line on one side of the square, and those from the western district on the opposite side. The Secretary of Native Affairs and I were located under the roof of a native fale which was about midway between the two lines. From this place I addressed the Assembly, the Secretary of Native Affairs interpreting, as I proceeded. I informed them of the need of determining the rate of taxation for the next year, and also pointed out the great need for good roads. There had been much talk of a road from Pago

Pago to this village, the idea being that the United States would pay for its building. I informed them that there was no money available for that purpose, but proposed that they should build the road at their own expense. I described briefly how roads are built in civilized countries at the expense of the people who derive the benefits from them. I pointed out what a blessing it would be for them to have a good road all around the island.

When I had finished the delegates took up the discussion of my proposal. First a delegate from one side would speak and then one from the other side. The speakers always carried "talking-sticks" which were sticks about eighteen inches long and a half inch in diameter, with some fiber shreds fastened to one end, resembling fly swatters. The speakers were good talkers, and some of them had real oratorical talents. It soon became evident that the delegates from the western district, while favoring the road, objected to the natives bearing the expense of it, while those from the eastern district supported my proposal. My friend, Chief Leiato and the other delegates from the district which had agreed to build the McKinley Road, were warm advocates of my proposal. They told how they had volunteered to build their road and spoke with scorn of men who would insist on the United States paying for an improvement so greatly to the benefit of the natives.

The discussion grew so long and warm that I found that I must leave before a decision was arrived at, but the next day a runner came to Pago Pago to inform me that the Assembly adopted my proposal.

Kava

Kava is a drink which is as important in Samoan life as tea is in that of the Japanese. It is made by mixing the finely divided root of the kava plant in water. If you are making a friendly call in a Samoan fale in the afternoon, you are sure to be invited to join in drinking the health of the assembled company in kava. The drink is prepared in the presence of the guests by the hostess or perhaps an attractive young girl of the family, or of the assembled company. It is a post of honor to be the kava mixer. A large wooden bowl is used for that purpose. It is placed on the floor near the middle of the room and the mixer squats by it with the rest of the company forming a circle around her. She

SAMOAN SIVA (NATIVE DANCE)

bites off a piece of kava root and chews it until it is sufficiently ground up by her teeth to be ready for the mixing when she puts it in the bowl of water, and proceeds. The mixing is done with both hands which are placed in the bowl of water and which push back and forth through the liquid a bunch of vegetable fiber acting as a sort of strainer. The mixer occasionally removes this fiber from the bowl, squeezing it, and then passing it to and fro in the air, keeping time to the music of a song which is sung by all the natives present. In doing this her arms and upper part of her body are moved with much grace. The song is usually led by one of the older natives and relates to some events in the history of the family or tribe. In this way their history is passed down from generation to generation. After passing the mass of fiber through the air for some time the mixer replaces it in the liquid and again proceeds with the mixing. In this way particles of air become enmeshed in the fiber, and then mixed with the liquid. In this manner the kava becomes vitalized with particles of air, although the native does not realize it.

The mixing proceeds until the liquid acquires the proper milky color, when it is served to those present, in cups made of cocoanut shells which are highly polished. On certain occasions the kava is served with much ceremony. In the Manua group the king is served by the maid of the village as a part of an elaborate ceremony, using the word "ipu" in handing the cup to him, and this word is not allowed to be used except in connection with the king's kava. The penalty for violating this ancient custom is to be driven out into the sea and never to be allowed to return. In other words, death by drowning, or hunger and thirst. The kava bowls are sometimes very handsome. They are carved from the trunks of hardwood trees and many have from three to twelve legs. They are valued according to the number of legs and degree of polish on the concave side.

After mixing and serving kava, a sediment settles on the bottom of the bowl, and this is rubbed into the grain of the wood until a high polish results, increasing with the age of the bowl, which means increasing rubbing. The taste of kava is not at first agreeable to Americans or Europeans, but it may be acquired. The drink is invigorating and very restful to one who has undergone great physical effort. It is said to be stupefying at times if

SAMOAN SIVA (NATIVE DANCE)

SAMOAN FALE (NATIVE HOUSE) OF MAUGA

drunk to excess, but it is not intoxicating as alcoholic liquors are.

It was the custom for the station ship to make monthly trips to all the districts of American Samoa to hold court and to attend to matters requiring the commandant's attention. On one of the trips of the *Abarenda* to the Manua group, she carried Mauga, the native governor of one of the districts of Tutuila as a passenger, as he desired to make some visits among these distant islands. We left him several hours on one of the small islands, and then got him aboard again and sailed away for Pago Pago, not realizing that anything unusual had happened. It later developed that in one of the villages kava had been served to Mauga, and when the cup was handed to him the ordinary Samoan word was used. But Mauga, not over bashful, stood on his dignity and suggested that the proscribed word "ipu" be used. The hosts said that was not allowed except to Tui Manua, the former king. Mauga, however, insisted that he was of equal rank with Tui Manua, who under the American Government was Governor of the Manuan District, while he was Governor of the Eastern District of Tutuila. This logic was enough and his hosts with great hospitality honored their guest with the "ipu." We knew nothing of this until our next visit to Manua, a month later, when we found that there had been great excitement over the violation of the ancient traditional law, and there were three men in jail charged with the crime of using the word "ipu" in entertaining Mauga with kava.

Their cases were tried by a court composed of the Secretary of Native Affairs, sitting with two district (native) judges. The court acquitted two of the men but the third having pleaded guilty, was sentenced to a mild penalty of imprisonment. We left Manua feeling that the matter was settled, but not so, for on a subsequent visit after Captain "S" became commandant, we found that there was still much feeling existing over the incident, and the natives requested Captain "S" to convene the High Court to reconsider the case. He accordingly organized a special High Court composed of himself, Commander "K," then in command of the *Abarenda,* and myself for the purpose. Of course we did not want to have the death penalty given these men, but at the same

time we wanted to show proper respect for the ancient traditions which were held in such veneration by the people. For a while we were in quite a dilemma as to how to act. Finally, however, we learned of a compilation of traditional laws of Manua, which had been made by a missionary. Among these was one which required that visitors should be treated with hospitality. We argued that the men under charges had been acting in obedience to this law in entertaining a visiting governor, with the "ipu," and that as this law was a matter of record while the other was not, it should be given preference, and therefore the action of the Lower Court was sustained. This seems to have settled the matter satisfactorily.

One of the main objects in view in the government of American Samoa as organized by Captain "X," was to maintain the rights of the natives, and to prevent unscrupulous adventurers from taking undue advantage of their ignorance. As an example, the natives were not allowed to alienate their land to foreigners, and alcoholic liquor was not allowed to be sold to them. The medical officers of the station ships were encouraged to give medical attention to the sick, and naval officers universally endeavored to promote friendly relations. As an evidence of the friendly feeling of the natives, toward officers and men, on the arrival of an American man-of-war, they would flock around her calling to officers through their stateroom ports, "You my felini," meaning, will you be my friend? If he said yes, they would begin an exchange of presents only to end when the ship left.

At each meal hour the natives were allowed to flock on board and were given large quantities of food. Mr. Frederick O'Brien in his *White Shadows of the South Seas,* paints a very dark picture of the harmful results of the contact between the white race and the South Sea Islanders. But certainly the American Navy's contact with Samoans has not been such as to deserve severe criticism. It is understood that Mr. O'Brien has spent some time in Samoa since he published the very interesting book named above, and I have heard that he intends writing another one regarding Samoa. It is hoped that he will show another side to his picture in the new book.

In the twenty years which have elapsed since the incidents here related took place, I have had duties which in variety cover a wide

range, but not wider than was covered by my duties as described, and never have I had to fill more different offices at the same time than while playing the rôle of "Pooh-Bah" in those distant "Mystic Isles of the South Seas."

DISCUSSION

The Practical Application of The Principles of High Command

(See Page 2041, December, 1922, PROCEEDINGS)

REAR ADMIRAL N. C. TWINING, U. S. NAVY.—In this thoughtful and logically developed paper by Captain Laning there is so much that is of value to the naval student of the subject that one hesitates to criticize or to disagree with any part of it. In its treatment of the problem of organization, however, certain statements are made which do not seem to be entirely justified by facts and which, if accepted as correct, lead to unsound conclusions.

The following extracts from the paper are quoted as embodying the burden of the author's argument for the organization of a fleet on the task-group principle:

(1) The first step in developing a war machine is to organize it properly to do the work it will be expected to do in war.

(2) . . . . on coming to a position of high command, the first thing an officer has to do is to make estimates of the situation, ascertain who the probable enemy or enemies are, determine the fighting his command may be called on to do in case of war with them, and then decide on how he will carry on the fight and on his *task organization* to fight that way.

(3) This *task organization* for war, derived from those estimates, is the organization a commander should use for his forces, not just during war but during peace as well.

These statements, broadly considered, seem to constitute an entirely logical argument for a permanent task-group organization of the fleet but when one looks more closely into the facts and conditions some doubt arises as to the correctness of the conclusions expressed in the second and third statements.

One may concede the possibility of estimating at any given time who "the probable enemy or enemies are" and, on the basis of such estimate, of making strategic plans for a war against such adversaries; but one may question whether the fundamental and permanent organization of the fleet should be planned on that basis. The doubt that arises on this point is due to consideration of a number of facts the principal of which are:

(a) The same task organization may not serve for a war against each of the probable enemies.

(b) The task organization that seems best today may be entirely unsuitable tomorrow and frequent changes in basic organization are undesirable.

(c) Even after the best possible estimate as to probable enemies has been made the actual fighting may take on a character entirely different from that forecast and the task organization may have to be entirely changed.

(d) Peace training must prepare individual units, groups, and the whole fleet for all their probable war activities but with the most emphasis laid on those that are most probable.

A war, regarded as a whole, may be considered as a task calling for a task-group organization of the fleet; looked at more closely it is seen to comprise a large number of less comprehensive tasks for each of which a different task-group organization may be required and for which several such organizations will certainly be found necessary. While the assignment of vessels to these task groups will be determined by the requirements of each particular case the normal employment of the elements of a navy must be determined by their types each of which has a principal function in the exercise of which it must be highly trained before teamwork in any combination of types can be effective. In the choir the fundamental requirement is that each member be able to sing his part.

The fighting vessels of a fleet comprise a few distinct types to each of which a primary mission in war belongs by reason of its characteristics. For battleships the principal mission must be combat with enemy vessels of the same type; they may, due to the exigencies of a campaign, necessarily be used for other purposes such as scouting, defense of bases, or other secondary sevice, but the fact of their principal or primary mission remains and it is to the perfection of their ability to carry out this mission that their major training must be directed. It is true that, during the whole course of a war, they may never be employed in this particular service (as was so nearly the case in the late war) but is it any the less obvious that they should be trained principally for that work and that the fleet organization should be such as will most effectively further such training?

To cite only one other example, destroyers have as their primary mission torpedo attack on capital ships; their employment on other service has, in the past, been due largely to a lack of vessels of the precise type required, a lack which will doubtless be experiencd in future wars as well. In the late war destroyers were employed less in their primary field than in other kinds of work the necessity for which was not foreseen. We all know from War College games as well as from actual maneuvers, that destroyers are often used for scouting for lack of other, and probably more suitable, vessels; we are also familiar with the solicitude of the commander-in-chief lest their employment on this duty interfere with their availability for what he felt to be their main task, torpedo attack on the principal enemy force.

Perhaps enough has been said to illustrate the point that the principal training of vessels in time of peace should be directed to developing their ability to carry out, in war, their primary mission as determined by type; training in the execution of probable secondary missions is only less necessary and, bearing in mind that we train, not vessels, but personnel—and a constantly changing personnel—training must be continuously carried on and its features continually repeated; the organization must be such as to facilitate such training.

Both chart maneuvers and fleet exercises—and war experience as well—impress the fact upon us that task groups are of an essentially temporary nature; that their constitution and composition are subject to frequent change as the needs of the situation change. Can anything so temporary in nature be made the basis of a *permanent* fleet organization?

As bearing on the question of changes in organization it seems pertinent to quote two further extracts from Captain Laning's paper:

(1) Even in a most highly developed navy an officer coming into a position of high command would be unlikely to find his command already organized as it must if it is to carry on in *his* way, and so he must always reorganize it sufficiently to fit his way. . . . If properly prepared for high command, an officer can quickly organize or reorganize his forces to meet his plans for carrying out his mission by simply dividing them into the task groups he knows he will use in war.

(2) As things are in modern navies, it often happens that neither the high commander nor his subordinates are familiar with all the uses or are well versed in the capabilities and limitations of the various forces and the new types with which they are working. . . . Even after all his preparation and training he must to a very large extent develop his plans and ideas after working with his forces to learn what they can do.

No argument further than that suggested by these two quotations appears to be necessary to indicate the unwisdom of a new high commander's immediately altering the *permanent* organization of his command: do they not, in fact, indicate, for a fundamentally sound permanent organization, an organization by types with all possible latitude granted to the high commander for forming temporary task groups "to meet his plans for carrying out his mission"? The initiative of a commander-in-chief will find ample scope in planning his fleet exercises in such a way as to:

(a) Train his type groups in the exercise of their principal functions;

(b) Train units in their auxiliary, temporary, or *accidental* functions by the constitution, from time to time, of temporary task groups.

May we not believe that:

(1) Permanent organization by types for training,

(2) Formation of temporary task groups for fleet exercises and for war,

will best meet the difficult conditions imposed by the ever-changing and unpredictable character of naval war and that they do not represent the indefensible "difference between . . . . peace organization and . . . . war organization"?

The Spirit of the Offensive

(SEE PAGE 2087, DECEMBER, 1922, PROCEEDINGS)

REAR ADMIRAL W. W. PHELPS, U. S. NAVY.—I do not agree with Lieutenant Commander H. H. Frost that (page 2092) "We have now to go back sixty years to the time of Farragut to find an example of such an operation" (the spirit of the offensive) (offensive operation). I think that Dewey's Battle of Manila Bay was just as fine an exhibition of the spirit of the offensive as any operation of his great teacher Farragut. Finer, Dewey had no reserves. Farragut had. Dewey had no base to fall back upon. Farragut had. Dewey could not have suffered a repulse. He *had* to succeed. Farragut could have stood a repulse and could have attacked and succeeded subsequently. The political conditions were such that a failure by Dewey would have had serious consequences for the United States in its world position. A failure by Farragut would have had no such serious consequences. So it was more important for Dewey to make a clean job of his operation, than was necessary in any one of Farragut's operations.

Sampson's Santiago operation must be mentioned. It also is a fine example of the spirit of the offensive. I do not mean to want to detract from the greatness of Farragut. I mean to point out that the naval officer who writes of the spirit of the offensive as found in U. S. Naval History, who entirely ignores the Spanish War and makes no mention of the throughly offensive spirit of Dewey's and Sampson's operations misleads that great body of naval officers who have entered the Navy since the Spanish War.

The Naval Policy of the United States in the Pacific Area

(SEE PAGE 409, MARCH, 1923, PROCEEDINGS)

LIEUT. COMDR. J. W. REEVES, JR., U. S. NAVY.—The article in the March Institute on "Naval Policy of the United States in the Pacific Area" cannot be passed by without comment. With the first eight parts or chapters of the article, I have no serious disagreement and no comment to make. It might be noted that they deal with matters which are supposed to require the most highly specialized knowledge, training and experience: namely, determination of policies and formation of plans. I do not claim that those of us who are younger in years and experience cannot, on account of this fact, have any worthwhile ideas on the subject. I do claim that our ideas are of necessity the result of short experience or possibly of theory alone. This can always be profitably kept in mind. Part IX states the conclusion of the article, which appears to be that the Navy's capacity for effective industrial action should be increased. The remedy to be applied appears to be to induce a realization on the part of all officers of the importance of industrial work and of their personal responsibility in connection with it. These are general statements with which

most people are bound to agree. However, I, for one, decidedly disagree with many of the minor and incidental statements in Part IX.

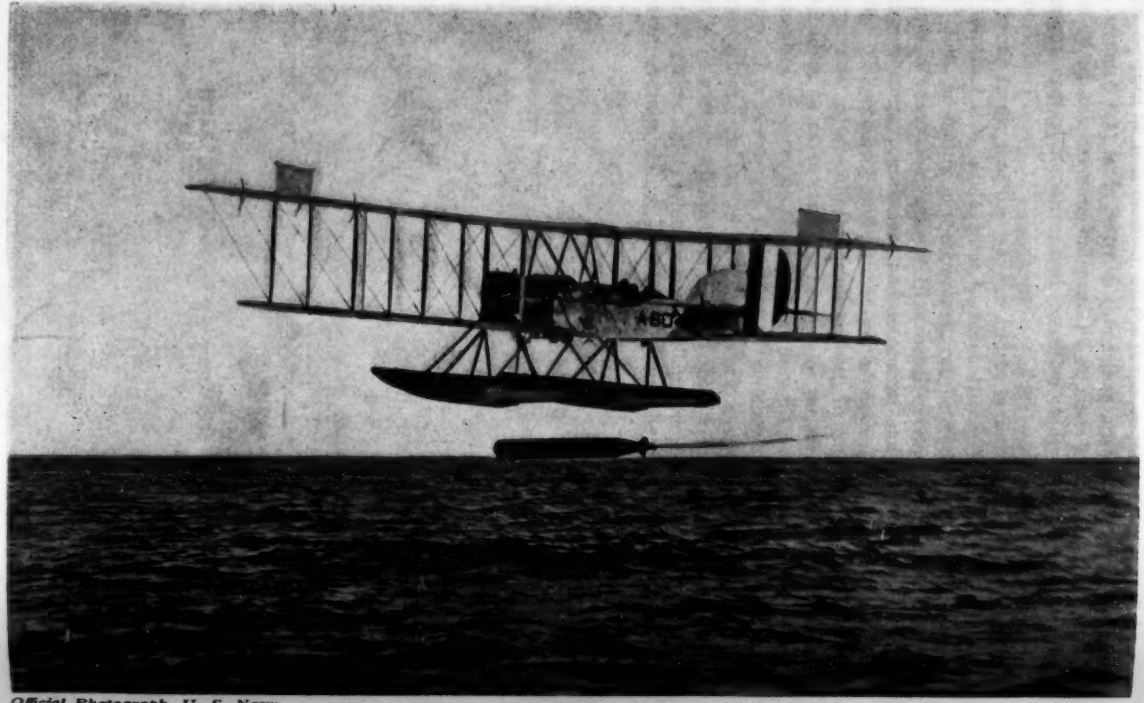
Most navy yards are similar in general but different in detail. Most of them are divided into two main departments, the industrial department and military department. Officers in the military department do not perform strictly line duties and nothing else, any more than officers in the industrial department perform strictly staff duties and nothing else. Every activity that is strictly a part of the industrial output of the yard is classed as industrial. All other activities are classed as military. In one large yard, the number of officers on duty in the military department is about half the number on duty in the industrial department. The numbers of staff and line officers in the military department are about equal. The largest subdivisions in this department are the medical division, the general court martial, and the marine detail. It is doubtful if any of these duties are of paramount importance. They are naturally of some importance; otherwise, they would not exist. The most important and essential duties in the navy yard are the industrial duties, for the yard's mission is an industrial one and its success or failure is judged from this standpoint. The article in question gives the impression that at navy yards military duties correspond to staff duties and only staff officers perform them. This is quite incorrect.

The industrial department at most yards consists of the machinery division, hull division, supply division, public works division, and a few smaller offices. At one large yard there is about an equal number of line officers and staff officers in this department. Naturally, the duties in the hull division, supply division and public works division are done by staff officers. If there were any reasons for doing so, a number of the positions in these divisions could be satisfactorily filled by line officers. This is because a great deal of the work is routine, executive work, requiring little special knowledge or training beyond what the average, all-round officer has. Special knowledge and training is always desirable. However, it is required so infrequently in many billets that a much more important consideration is good judgment, energy, initiative and executive ability. These are personal characteristics, quite independent of the branch to which the officer may belong. Duties in the machinery division are usually performed by line officers. In a similar manner, some of these positions could, if it were desirable to do so, be filled by staff officers. The point is that the vital thing in many of these positions is the possession of the personal qualities mentioned above, while special knowledge and training is secondary. It is not claimed that line officers could fill all staff positions. If this were so, there would be no room for argument as regards amalgamation. But, the idea that every billet in a staff division—hull division, for example—can be filled only by a staff officer of that corps is absurd.

This brings up what is, to my mind, one of the most objectionable features of the corps system. I do not say that the corps system is necessarily all wrong or should be done away with. But it will doubtless

be admitted that there are objectionable features. One of these is the idea that an officer is competent to perform all the duties of his billet simply because he is a member of the corps under which that billet comes. It is assumed that he is better qualified than anyone not in that particular corps. And, this is quite independent of such personal qualities as good judgment, energy, initiative, and executive ability—which he may or may not possess.

It seems to me that the Navy would be better off if all hands, line and staff, realized that, aside from a comparatively few designing specialists, most billets, no matter in what branch, can be efficiently filled by any officer who has a reasonable amount of general experience, coupled with good judgment, energy, initiative, and executive ability. We need a certain number of specialists, and cannot get along without them. But, in my opinion, a lot of so-called specialists, both in the line and out, are being carried along as extra cargo on account of the mistaken idea that they and no one else can carry on the jobs that they fill, and that the fact that they are specialists is enough, regardless of whether they possess or show any other qualities. So far as navy yard work is concerned, this is not mere theory. To anyone who doubts it, I can show a considerable number of so-called specialist billets which I could fill properly. And, so can any other officer of average ability. If not, he should be ashamed to draw his pay.



Official Photograph, U. S. Navy

A Modern U. S. Navy Torpedo Plane

PROFESSIONAL NOTES

PREPARED BY

LIEUTENANT COMMANDER F. W. ROCKWELL, U. S. NAVY

AND

LIEUTENANT J. B. HEFFERNAN, U. S. NAVY

GENERAL ARRANGEMENT

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GREAT BRITAIN

NAVAL POLICY.—The reception accorded the Navy Estimates by the House of Commons has on the whole been good; much better than on most other occasions of the kind in recent years. It is probably right to attribute this to a general feeling of confidence in the policy so ably outlined by Mr. Amery. With the majority of members so keen on economy in national expenditure, less attention than might have been expected was aroused by the facts given by the First Lord showing how we have not only gone far beyond the strict terms of the Washington Treaty, but that our action has been taken in advance of that of any of the co-signatory Powers. No other nation has, like ourselves, broken up seventeen splendid and comparatively modern capital ships and numerous other craft, cut down reserves of ammunition, fuel and stores, and postponed necessary expenditure which ought to be incurred now. As Commander Bellairs put it, our motto has been "Trust and Scrap," that of the other Powers "Wait and See." Many people, who, like Mr. Lambert, are concerned at the taxation of this country being £16 13s. per head, as compared with £6 in America, would counsel us to trust still more. The German Fleet, we are told unceasingly, is at the bottom of Scapa Flow; we have no other immediate menace, why should we not drop quietly into a third-rate position? It is well that Mr. Amery reminds these pessimists that we have everything at stake on the sea, even in times of profoundest peace. A great Navy, once let down, cannot be improvised in an emergency.

A Modern U. S. Navy Torpedo Plane
Official Photograph, U. S. Navy

In itself, it may be costly, but it is a form of insurance which is indispensable to security.

The House of Commons is evidently satisfied that the country gets full value for the money spent on the Navy. Even Mr. Newbold, the future Admiral of the Red Fleet, felt bound to admit that: "I do not think that the Americans, although they can spend very much more money on naval armaments than this country can at the present time, can thereby necessarily get a Navy anything like the equivalent of ours." This is a tribute to those personal factors without which the finest material is useless. As Mr. Amery showed, the process of cutting down by 20,000 the officers and men was both difficult and painful, because the lists had already been weeded out by previous reductions. The Board had to scrutinize all records in order to find some way of deciding who among officers of high ability and distinguished service could be said to have even a shade behind their fellows. He paid a tribute to the patient care and fairness of the Sea Lords in this respect. The result of their work is that the present officer *personnel* may be said to be incomparable. It is to be hoped that future entries will keep it at the same high standard, and that parents will not be discouraged from putting their boys into the Service through mistaken ideas as to the future.

Turning to the material of the Navy, the greatest interest naturally centered in the provision which is being made for developments at Singapore and for oil storage. Among the critics of the former was Sir Godfrey Collins, who spoke as a layman, but who was once a midshipman in the Navy, and who ought, therefore, to appreciate Mr. Amery's point that at present there is no dock in British territory in the East capable of taking a capital ship. It would be interesting to know on what grounds Sir Godfrey asserts that it is opposed to the naval policy of the past fifty years to construct dockyards far from the center of the Empire. Surely it has always been the policy that the distribution of the fleet must depend on the strategic circumstances of any given time, but that the Navy must be free to go anywhere. It is not free, as the First Lord has shown, to go anywhere today owing to the fact that we have neither supplies of oil nor the docking and repairing facilities required to give it the necessary mobilty. We can at present neither send our battle fleet to the Far East nor maintain it there. This is the situation which calls for remedy, but it will be several years before the remedy is effective owing to the leisurely fashion in which, for reasons of economy, the work will be done. In a scheme of £11,000,000 for docks, workshops and stores, £200,000 does not go far. It will be interesting to see what attitude the Dominions take toward the cost of the project when the Imperial Conference, which it is expected to hold this year, comes to consider the matter.—*Army, Navy, and Air Force Gazette*, 31 March, 1923.

AUSTRALIA SELLS HER NAVY.—The decision of the Australian Government to sell twenty-four units of the Dominion Navy, as set forth in a recent Melbourne despatch, virtually means the end of Australia's present naval establishment.

Thus abruptly and emphatically Australia has cast to the winds the recommendations made by Lord Jellicoe following his world-wide tour of the Dominions soon after the close of the World War. One of the strongest of his recommendations was that in which he urged the organization of a powerful fleet permanently based in Far Eastern waters. Based on the value of oversea trade, he suggested that Great Britain, Australia and New Zealand divide the burden of its estimated annual cost of £19,700,000 in the ratio of 75-20-5. The composition of the projected Far Eastern fleet was tentatively set at eight super-dreadnaughts, eight

modern battle cruisers, ten light cruisers, forty modern destroyers, thirty-six submarines, excluding those in Indian waters, besides the auxiliary vessels necessary to make a well-founded fleet. Under Lord Jellicoe's plan Australia's contribution to this fleet would be a material one, and the annual cost to her exchequer would be between four and six million pounds a year.

There is no warrant for assuming that the Australians will never replace the ships to be sold with other and more powerful units. Yet there can be no doubt of the significance of the Dominion Government's decision. Its purport is plain. With her sister dominion Canada, Australia prefers to turn over to the Imperial Navy the main burden of the naval defense of the Dominions, should the danger of such an attack ever arise. The projected Singapore naval base, one of the largest in the world, must be maintained by Great Britain alone. In fulfilment of the policy of a "White Australia," it may also come about that Australia will grow more and more thankful that the Stars and Stripes still flies in Pacific waters.—*Boston Evening Transcript*, 2 April, 1923.

FRENCH AIR STRENGTH DISTURBING TO BRITISH.—Former Lord Chancellor Birkenhead in the House of Lords this evening forced the Government to admit it is seriously considering the possible necessity of increasing the air force, in view of the superiority of the French in this branch.

After quoting figures relative to the size of the two air forces, Lord Birkenhead declared:

"This is a most alarming state of affairs. The Government will be lacking in its duty to the country unless it affords an adequate air force."

He pointed out France built up a great air force while not paying her debt to Britain. He added that there is no truth in stories of great German air preparations and continued emphatically:

"That makes the situation more alarming. I do not remember a time when the tone of the French press has been less friendly to this country. This country cannot content itself in the next four or five years with an inferiority in its air force which it would not content itself with in the navy."

The Duke of Sutherland, Under Secretary in the Air Ministry, replied for the Government. He explained that after the armistice the British Government decided there could be no great war for ten years.

"But the Committee for Imperial Defense is considering the position," he added, "and if it decides that this formula no longer holds good and that the circumstances warrant a larger air force, it is quite possible it will be increased."

Finally Lord Salisbury, Lord President of the Council and deputy Government leader in the House of Lords, announced Lord Balfour, who has long been connected with questions of imperial defense, and Lord Weir, who was director of aircraft production during the war, had been added to the Committee for Imperial Defense to aid in the consideration of this matter.—*Baltimore Sun*, 22 March, 1923.

FRANCE

FRENCH NAVAL STATUTE.—The "naval statute" in France is a scheme embracing a wide policy of organization and construction, of which the result is to provide a homogeneous fleet capable of carrying out certain well-defined objects. The previous "statute" was prepared by the late M. Delcassé and was interrupted by the mobilization of 1914, which put the navy entirely in the background, and as the termination of the war left France with a sadly diminished fleet of little value, the question arose of creating an entirely new navy in accordance with the changed conditions

of naval defense. In the years immediately following the Armistice the international situation lacked elements upon which to establish the basis of a future policy. The destruction of the only naval power which threatened the security of France removed the necessity of organizing a coast defense, especially in view of the proposals then put forward for a "pact of guarantee." Nevertheless, opinion in France has never been in favor of relying upon others for protection, and the construction of a sufficiently powerful navy continued to be the background of national politics, as was shown by the claims put forward by the French delegates at the Washington Conference. It must be admitted that the signing of the Treaty did not meet with unmixed approval in France, where its presentation to Parliament was delayed until the Conseil Supéreur de la Marine had settled upon the main lines of the "naval statute." There seems to be little doubt that the Washington Treaty will be ratified with certain reservations, notably in providing greater latitude for the withdrawal of France in case of emergency. It is argued that the country cannot allow itself to be bound down by limitations which may affect the national security. The whole question has, therefore, developed much larger issues than were presented at the time of the Washington Conference, when it was urged that the French naval policy aimed merely at an efficient coast defense and the guarding of a seaway between France and North Africa with the aid of submarines and fast cruisers.

That policy certainly underlies the first part of the progam of naval construction which was begun recently. A beginning had to be made with the most necessary and least costly types of craft, consisting of three fast unprotected cruisers, six destroyers, twelve torpedo boats and six sea-going submarines. This short program is to be extended by a second installment of constructions from 1925-30, and the list of vessels in the proposal which has just been submitted to the Chamber of Deputies comprises six light cruisers, fifteen destroyers, twenty-four torpedo boats, four "cruiser submarines," thirty first-class submarines, two mine-layers and four oil transports. For the moment the French are concentrating upon the submarines and light surface craft authorized by the Treaty and forming part of the defensive organization which will be completed by an air service in conjunction with seaplane carriers and an unrestricted number of small submarines for coast protection. The submarine has always cast a spell over French public opinion, which exerts a powerful influence upon the decisions of the Government departments. Public opinion is by no means satisfied with the limited character of the submarine program, and there will certainly be a lengthy debate on the restrictions imposed by the Treaty on sea-going submarines when the "naval statute" comes up for discussion. Consequently, the purely defensive policy is already assuming the offensive, and while having the right to build as many light underwater crafts as they please for coastal operations, our French friends will not submit without protest to any considerable limitation of sea-going submarines. On the other hand, the Conseil Supérieur de la Marine has never been willing to sacrifice capital ships to under-water vessels, and the arguments against a complete dependence on submarines have only been partially modified by the association of submarines with seaplane carriers, whereby the submarine will be given a wide range of vision. Still, submarines are neither able to navigate at the speed of surface ships, nor to attack in formation under water. Consequently, they suffer from limitations which render it undesirable to sacrifice large surface vessels.

In the first two installments of the naval program no provision is made for the construction of capital ships. That omission is partly due to the limited financial resources and, more especially, to the belief that it is wise to wait for further battleship developments before deciding upon a definite type. In any case, it is not likely that new capital ships will be constructed

before 1930, by which time some of the existing ships will be dismantled and full advantage will be taken of the 177,800 tons allotted by the Washington Treaty to create a homogeneous and entirely up-to-date fleet. The situation, therefore, is fairly clear, and will not be considerably modified by the forthcoming debate in the Chamber of Deputies. In the present state of finances the country must do the best with its expenditure, and it considers the only possible plan to be to build submarines, light surface ships and aircraft, but the program now comprising "cruiser submarines accompanied by seaplane carriers will be compelled eventually by a number of new capital ships. The program itself is not dependent upon the ratification of the Washington Treaty, for in the improbable event of Parliament insisting upon reservations which the other signatory Powers could not accept, the program would be extended as circumstances required. It is affirmed that efforts will be made to make a ratification of the Washington Treaty conditional on the Versailles Treaty being carried out in its entirety. If this be, indeed, the case, complications may arise that will endanger the agreement which has been come to amongst the leading Powers for a limitation of naval armaments.—*The Engineer,* 6 April, 1923.

FRENCH NAVAL STRENGTH.—The following statement, which includes all battleships, cruisers, light cruisers launched since 1902, and flotilla leaders, destroyers and submarines launched since 1907, gives the present naval strength of France:—Battleships: Dreadnaught, six; pre-Dreadnaught, three; battle cruises, *nil;* cruisers, six; light cruisers, five; flotilla leader, one; destroyers, fifty; submarines, forty-seven; airships, twenty; planes with service units, thirty-eight; planes in training units, sixty.—(Navy Parliamentary Secretary.)—*Army, Navy, and Air Force Gazette,* 24 March, 1923.

FRENCH NAVAL PLANS.—FUTURE CONSTITUTION OF THE FLEET.—Paris, Thursday.—The Naval Statute Bill, distributed in the Chamber today, does not provide for the execution of any particular measures, but establishes a theoretic or ideal constitution of the fleet similar to the law establishing the Army cadre.

The bill fixes the total tonnage of each class, while leaving the number of units to be decided subsequently in accordance with evolution of scientific theory.

The theoretic composition of the fleet laid down is as follows:

	Tons
Battleships	177,000
Light surface craft, cruisers, destroyers, and torpedo boats	360,000
Submarines	65,000
Aeroplane carriers	60,910

The report on the bill, discussing the rival claims of capital ships, light surface craft, and submarines, favors a judicious admixture of all three as indispensable in the present conditions of warfare.

It declares that the bill represents a considerable reduction compared with the size of the French naval forces in August, 1914, although the 1912 program was then far from completion. "Such reduction," it is added, "clearly exposes us to certain risks in future. It is because it was profoundly convinced that we ought resolutely to face those risks in order not to aggravate the difficulties of our financial situation that the Higher Council of the Navy has ratified this bill."—Reuter.—*The Naval and Military Record,* 28 March, 1923.

FRENCH NAVY NOTES.—The six 2,400-ton destroyers are well in hand, *Jaguar* and *Panthère* at Lorient, *Tigre* at Chantiers de Bretagne (Nantes),

Chacal (Dubigeon, Nantes) and *Leopard* and *Lynx* at Chantiers de la Loire, St. Nazaire. Expert opinion is unanimous in considering them as masterpieces of designing work and of fighting value. Their pleasing silhouette (one thick mast, three funnels), the well-studied distribution of their 130mil. guns and 22-inch torpedo-tubes, do not give the cramped and top-heavy impression which the sight of the ex-Boche *Senès* conveys to a trained observer. Sea-keeping qualities have obviously been looked after: the freeboard forward exceeds six métres; the bows are yacht-shape, much overhanging. Three 5.2-inch guns will fire ahead, as the raised platform forward supports two weapons on a twin mounting that fires over the No. 1 gun. Curved armor shields protect the whole armament. The standard of structural strength is quite satisfactory.

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Old "loup de mer" shake their heads when they picture the extremely long and narrow new *contre-torpilleurs* and *croiseurs lègers* ploughing heavy seas at some 35 knots, when they see the flimsy plates of super-tensile steel that are covering delicate frames. The tragic fate of the British *Cobra* and *Viper*, that were on paper such masterpieces of work, is being quoted, and also the disappointing experience gained with the vibrating Bertin cruisers, exceedingly fast on paper and even for spurts in pond-like waters, but obliged to crawl at 12 knots in heavy weather. They remember the destroyer *Bouclier*, that reached 37 knots on trial and with trial load, but that started leaks as soon as she was pushed beyond 32 knots under service conditions. The greater the speed the more crushing the strain, and consequently the higher the standard of all-round robustness. Unfortunately, robustness is a too much avoir-du-pois virtue; it isincompatible incompatible with success in that thorough-going competition which destroyer and cruiser rivalry is more than ever.

Constructional experts whom I have consulted on the matter contend such fears are absolutely groundless, and for two main reasons: viz., Minute and painstaking experiments in laboratories, in trial tanks, and at sea in ex-German as well as in French boats have preceded the designing of the new *contre-torpilleurs* and *torpilleurs d'escadre* of 2,460 and 1,427 tons, the delays in ordering them being, as a matter of fact, due to the desire to obtain a superior standard of structural strength and also of motor reliability. Secondly, it is pointed out, the Germans and also the Italians have gone much further than the French, and without so many drawbacks in the way of piling up motor-power and armament on diminutive displacements. *C'est la voie du progrès.* The constructional art is getting more and more difficult, and international rivalry every day keener. To keep up with the times, and even to lead, is the only course left open to a navy desirous of conciliating a moderate expenditure with superior efficiency.—J. B. Gautreau in *Naval and Military Record*, 21 March, and 28 March, 1923.

GERMANY

TORPEDOES AND NAVAL MINES.—It is stated in Germany that during the war their submarines discharged about 5,000 torpedoes, of which number fifty per cent took effect. A high percentage of hits is claimed also for the torpedoes fired from destroyers and other surface warships. In the course of a recent article, a former *U*-boat commander states: "Rarely indeed did our torpedoes fail us. On comparing notes during and after the campaign, we found that not more than two per hundred were defective in the sense of running erratically, failing to keep their depth, or to explode on hitting the target. Further, our torpedoes were considerably more powerful for their size than those used by the enemy. This knowledge of the accuracy and destructiveness of our weapons gave us immense confidence in attack.

It was all the same whether we fired at extreme or at point-blank range—the torpedo was certain to run straight, to maintain its set depth, and to explode with stunning force when it reached the target. It was therefore unnecessary to allow any margin of error so far as the mechanical factor was concerned." If the German torpedoes were superior to other types, it was because Germany had always paid marked attention to the development of this weapon and was not satisfied until it had been made as mechanically perfect as possible.

With the exception of a few purchased abroad from time to time for experimental purposes, all torpedoes for the Navy were manufactured in the Government factory at Friedrichsort, near Kiel, to which was attached a magnificently-appointed laboratory. Here experiments went on continually, each model produced being superior to the preceding one in range, speed, and power. As long ago as the nineties German torpedoes were remarkable for the weight of their explosive charge. They had a diameter of 17.7 inches and a warhead of 198½lb. of wet guncotton. Many of these old weapons were successfully employed by *U*-boats during the war. The torpedoes with which Weddigen, in the *U-9*, sank the three *Cressys* dated from 1905. All the 17.7-in. torpedoes of later construction were charged with 264½ to 330lb. of an explosive consisting of a mixture of T.N.T. and Hexa—produced by the Kruppamühle factory in Upper Silesia. This composition was at least thirty per cent more powerful than wet guncotton.

About the year 1906 the 17.7-in. model was superseded by the 19.7-in., with a warhead of 440lb. Most of the torpedoes fired during the war were of this type and very destructive they proved. In 1913 a specially heavy torpedo was designed for use in large warships. It had a diameter of 23.6-in. and carried 550lb. of explosive. This formidable weapon was first supplied to the battle cruiser *Lützow*, and later to a few particularly large destroyers. It was too heavy and bulky for use in submarines though plans for a *U*-cruiser with four 23.6-in. tubes were prepared, the idea being that this boat should attack enemy capital ships and no other targets. Another claim advanced on behalf of the German torpedo referred to the stability of its warhead. When the battle cruiser *Moltke* was successfully attacked in the North Sea by a British submarine the torpedo exploded in the torpedo-room of the ship, but in spite of the fact that three torpedoes lying there were broken up by the force of the explosion, not one of them detonated.

The old 17.7-in. bronze torpedo had a length of 15ft., which increased to 17½ft. in the improved model of that diameter, and to 23ft. and 29½ft. respectively in the 19.7-in. and 23.6-in. torpedoes, while the air pressure rose from ninety atmosphere to 175. The maximum ranges of German torpedoes in service or under manufacture at the outbreak of war were: 17.7-in. type, 6,000 metres; 19.7-in. type, 10,000 to 12,000 metres; 23.6-in. type, 15,000 metres. There was, however, no corresponding increase in speed. This would have been easily attainable by fitting more powerful engines, but it was found on experiment that the torpedo, when running at more than 36 knots, failed to keep its proper depth. Consequently a velocity of 35 or 36 knots was accepted as the maximum for all types. In 1918 a new model was produced, which would keep its depth when running at 40 knots, but only a few of these weapons were ready before the armistice.

During the war attempts were made to eliminate the upheaval of water which followed when a torpedo left the tube of a submarine, and which not only gave warning to the ship attacked, but tended to betray the presence of the submarine itself and expose it to depth-charge attack. Eventually it was found possible to cut off the air pressure in the tube as soon as it had fallen below a certain degree, and in this way to minimize the disturbance on the surface of the water at the moment of discharge; but the improve-

ment came to be used in the war. The electric "trackless" torpedo, which would have made submarine attack absolutely invisible, and therefor infinitely more dangerous, was being developed in 1917-18, and a few had been experimentally issued before the end of the campaign, but there are no details of their performance. Another war-time improvement was the fitting of a "lever pistol," which, projecting above the nose of the torpedo, would strike the hull of a ship and thus detonate the warhead even though the torpedo itself had passed somewhat below the target.

As regards quantity production, the highest output in time of peace was found, of course, to be quite inadequate for war requirements, and when the *U*-boat campaign was opening it looked as though a serious shortage of torpedoes would occur. The total number delivered in the year 1913 had been 193, but there was a fairly large reserve on hand at the beginning of hostilities. Measures were at once taken to increase the rate of production, and to such good purpose that in the month of September, 1918, no less than 774 torpedoes were delivered. The output had therefore increased forty-eight-fold in the space of five years. It is claimed that in spite of this rapid production there was at no time any falling off in the quality of the torpedoes. This, however, does not accord with the evidence of Allied naval and ships' officers, who state that in the second half of the war German torpedoes often ran badly, and not infrequently failed to explode on striking the target.

Next to the torpedo, Germany pinned her faith to the mine, a weapon in the construction and employment of which she excelled for the greater part of the war. Deadly as the first German mines seemed to be, it appears they did not satisfy the naval authorities, who demanded a more powerful charge, and the later models were therefore filled with 440lb. of T.N.T., or twice as much as the 1914 type contained. Quite early in the war British submarines caused so much trouble and annoyance in Heligoland Bight and off the German Baltic ports that it was found necessary to design a special type of mine for their benefit. This contained about 45lb. of T.N.T., and it was manufactured in large quantities, but does not seem to have been particular effective in keeping our submarines at a distance.

Mine-laying by submarine was not a German innovation, though it is often claimed as such. As early as 1908 a submarine mine-layer was designed in Russia, and at least one boat of this class was in service before the war. It was not until September, 1914, that Germany began to build her first under-water mine-layers: viz., those of the *U-C* class. There is reason to believe that submarine boats for the laying of blockade mines had been designed in France and Italy previous to the war, and I am informed that plans for similar vessels had been drawn up in the United States in 1912, though none were actually built. Germany must therefore be given the credit of having produced the first practical submarine mine transport, and thus opening up a new field of mining tactics. Following the small *U-C* class, she built the *U71-80* series, of 755 tons, and then the nine big ocean-going mine-layers of the *U117-125* group, of 1,163 tons, which were specially designed for long-distance operations and proved fairly successful at this work.—Hector C. Bywater in *Naval and Military Record*, 4 April, 1923.

GERMANY BUILDING MOTORS FOR GIANT SUBMARINES.—Paris, April 6.—A giant submarine motor, which had been brought to a high state of mechanical perfection, was found in the Benz automobile works—a Stinnes holding—when French troops recently occupied Mannheim, according to a statement in the *Echo de Paris*.

The motor is of the Diesel type, capable of developing between fifteen and twenty thousand horsepower. French engineers who ran it seventy-two

hours continuously, pronounced its regularity of movement perfect. A number of smaller submarine motors also were found in the same factory.

Commenting on the find, the *Echo de Paris* says: "If Germany makes these prohibited motors only a few paces from France's military frontier one can only guess what other preparations for war she is making in the interior of the country. England cannot afford to be indifferent to this discovery, because it shows clearly that at the moment when the English are engaged in carrying out the terms of the Washington Arms Conference, Germany is far from renouncing her designs for war-time warfare."—*Boston Evening Transcript*, 6 April, 1923.

SPAIN

Although the finances of Spain are not in a flourishing condition and the campaign in Morocco is swallowing up a great deal of money, there has been no drastic curtailment of the naval program adopted in 1915, though its completion has been delayed both by shortage of material during the war period and various economic difficulties met with in the past four years. Thus, the battleship *Jaime I.*, laid down in 1912, was not finished till 1921, and the cruiser *Reina Victoria Eugenia*, begun in 1915, was nearly seven years under construction. This latter vessel, which resembles our *Town* class cruisers in design and general appearance, suffers from the handicap of low speed, her maximum performance on trial being 25.77 knots. She is, however, a good weartherly ship with moderate protection and an armament of nine 6-in. 50-cal. guns. Of smaller dimensions but greater speed are the *Don Blas Lezo* and *Mendez Nunez*, sister cruisers laid down at Ferrol in 1917. The *Lezo* went afloat last July, but no report is to hand as yet of the launch of the *Nunez*. Like the *R. V. Eugenia*, these two ships embody British principles of design to a marked degree, with certain modifications suggested by Spanish requirements. Except for the disposition of their guns, they might be copies of the British *D* class. They are expected to steam 29 knots at full power. The maximum oil supply of 840 tons is considerably less than that of our cruisers of about the same displacement. Of the six 6-in. guns carried only four can be worked on the broadside.

Work is shortly to be commenced at Ferrol on two cruisers of a larger and more powerful design, the names of which have not yet been announced. In dimensions and other features they are comparable to our *E* class. Their leading particulars are: length, 531½ft.; beam, 53ft.; displacement, 7,975 tons; speed, 33 knots. The armament is to be eight 6-in. guns, all on the center-line, six of the guns being twin-mounted, with an anti-aircraft battery of four 4-in. guns and twelve 21-in. torpedo tubes. These ships are understood to have been designed by Sir Philip Watts. Other vessels building are three flotilla leaders of 1,650 tons and 36 knots speed, carrying five 4.7-in. guns; three destroyers of 1,145 tons and 34 knots; four submarines, *Holland* type, of 610 tons; and three fast gunboats, of 1,335 tons and 18 knots. Six large submarines are to be commenced this year. When all these units are completed the Spanish Fleet will be easily first among the navies of the minor maritime Powers. But the Government's policy of spending so much money on naval construction has been severely criticized in the newspapers, which demand to know the object of all this activity in the dock-yards and arsenals. In proportion to her revenue, Spain, they assert, has the largest naval budget in Europe, though there is no perceptible threat to her sea interests in any quarter. If this criticism continues, the authorities may be compelled to effect a drastic cut in the shipbuilding program. In fact, it is already reported that a number of submarines have been cancelled.

The new Spanish cruisers have a fault which is common to all our own vessels of this type, as well as to those of Japan, namely, the absence of protection to their guns. It has been frequently remarked in these notes that the practice of mounting cruiser guns behind open shields is directly opposed to war experience, and any ship so armed must be considered inferior in fighting value to one that carries its guns in turrets or casemates. The United States has led the way by putting the entire battery of the *Omaha* class under armor protection; France has followed the same principle in her *Lamotte-Picquet* class, and Japan is understood to be adopting closed turrets for the new cruisers of 7,100 and 10,000 tons. This system means extra weight, but there can be no question as to its advantage from the tactical point of view. Two guns enclosed by armor are probably of more value than three devoid of such protection.—Hector C. Bywater in *Naval and Military Record*, 28 March, 1923.

JAPAN

NEW TYPE LIGHT CRUISER.—Among the Japanese light cruisers now building there is one of a new type, the design of which is of particular interest. This is the *Yubari*, laid down last year and due to be launched at an early date. As indicated above, all cruisers of the post-war program have been fairly large vessels, with excellent sea-keeping qualities and a wide radius of action. The *Kuma*, for instance, is capable of steaming 6,000 miles at 15 knots. But the *Yubari* is of 3,100 tons only, her other dimensions being:—Length, 435ft.; beam, 39½ft.; draught, 11¾ft. The designed speed is 33 knots, and the armament six 5.5-in. guns, with four torpedo tubes. Judging from these particulars, the ship is an enlarged flotilla leader, but she may equally well be a mine-layer—a supposition the more plausible in view of her light draught.

NAVAL TALK UPSETS JAPAN.—Tokio, April 6.—Japanese public interest in naval matters has been strongly revived as a result of the Anglo-American gun range discussions and reports of the new American auxiliary program. Despite official expressions of confidence in the eventful ratification of the naval treaty a note of doubt is creeping into press comments concerning it. Admiral Sims's recent speeches, advocating a naval base at Guam and the strengthening of the Philippines defenses, has caused unfavorable comment, most Japanese failing to estimate the real weight of the retired officer's pronouncement.

A similar note was evident in the discussion of Assistant Secretary Roosevelt's recent statement on the Navy Department's intentions regarding auxiliaries and Secretary Denby's expressed desire to strengthen the auxiliary fleet to the proportion indicated by Secretary Hughes' original proposals. Two of the most influential journals comment editorially on the American naval situation, suggesting that nothing would deal a heavier blow to the Washington Treaty than evidence of American dissatisfaction or lack of confidence in it. The *Yomiuri* urges a new naval conference to discuss gun ranges, auxiliaries and Pacific defenses, suggesting that Japan and the United States cancel the Lansing-Ishii agreement conditional on Franco-Italian ratification of the naval and nine-power treaties.

"If America so acts as to cause a question as to her willingness to adhere wholly to the spirit of the Washington Treaty," it says, "world peace will be menaced more greatly than ever."

The *Osaka Mainichi* comments on the proposed American auxiliary program and naval base plans by declaring the navalists' propaganda in urging American fleet expansion causes other nations to doubt America's willingness to live up to the settlements she sponsored. A majority of the recent comments is marked by doubt as to the United States intentions, coupled with a desire that the naval treaty remain effective.—*Boston Evening Transcript*, 6 April, 1923.

UNITED STATES

A SUMMATION OF THE FLEET MANEUVERS.—Canal Zone, March 20.—The results attained in the working out of the naval problem in the recent maneuvers in which the Panama Canal was attacked as well as defended were reviewed today by Admiral Hilary P. Jones, commander-in-chief of the United States Fleet, for the benefit of Secretary Denby and members of the Congressional party brought to the Isthmus to make a first-hand study of the defenses of the canal.

The problem involved a theoretical attempt by a strong enemy naval force to establish a base on the Pacific Coast from which to make aircraft attacks aimed at the destruction of the great dam at Gatun and rendering the use of the canal impossible by an American Naval force despatched from Atlantic waters to destroy the enemy fleet. The answer, as worked out by the naval forces, was that an enemy force, under the conditions laid down, could make a landing at Culebra Bay on the coast of Costa Rica, a considerable distance north of the Pacific entrance to the canal, establish an aircraft base at that point and send bombing planes to the Atlantic side of the canal.

Weak Point in Panama Bay

In a separate frontal attack on the western terminus of the canal, undertaken at the special request of the army, the enemy fleet, commanded by Admiral Edward W. Eberle, commander-in-chief of the Pacific battle fleet, revealed that there is a point in Panama Bay from which an enemy fleet, once in control of the sea and air, would be able to attack with impunity Miraflores locks and fortifications guarding the Balboa end of the waterway. This weak point is within range of twenty-four of the 14-inch guns now in the Pacific battle fleet, and from that point Admiral Eberle's fleet was able to bring eighty-two other 14-inch guns to bear on the fortifications now existing at the western end of the canal while two battleships were attacking the locks. The present effective range of the guns guarding the western entrance is about 20,000 yards, so that a fleet stationed under a smokescreen at this weak point would lie beyond the range of the coastal fortifications.

This defect can be easily corrected by placing heavy guns on Toboga Island, which lies in Panama Bay, nine miles beyond the coast fortifications that are furthest out. The canal can also be made impregnable by following the recommendations made by Admiral Jones and by army officers in the Canal Zone. Both army and naval experts now stationed in the zone or serving with the fleet declare the air forces of the canal must be made stronger. President Harding will be asked to urge Congressional sanction for making the canal invulnerable.

Secretary Denby's party leaves Balboa with a feeling that the accomplishments of the United States Fleet in the nautical problems and maneuvers have justified the labor and money spent in bringing it together for the most comprehensive maneuvers held in the Western Hemisphere.

"The working out of this problem," said Admiral Jones, after Secretary Denby had presented him and Admiral Eberle to the Congressmen, "on the part of the battle fleet under command of Admiral Eberle was really in the nature of an overseas expedition and was of such a character as to bring rather a severe test on certain elements, notably the submarines and the destroyers. The two submarines detailed as decoys were required to make a trip of over 3,000 miles continuously at sea.

"In regard to the air force of the Scouting Fleet I need only tell of its accomplishments for you to realize the work done by the officers and men. Eighteen airplanes left Hampton Roads early in January and made the trip to Panama under their own power. In three days after their arrival all eighteen were out on the scouting line 200 to 300 miles up the west coast."

Lesson Learned from Problem

In his review of the problem involving the naval attack on the canal Admiral Jones gave a general outline of the motives, movements and conclusions. Later he will make a more comprehensive study of all the reports from the different commanders and draw up a complete résumé that will serve the Navy Department in a study of the proper defense of the canal. Admiral Jones stated that some of the benefits to be gained from working out of this could be summarized as follows:

"First—There are certain weaknesses in the Panama Canal. These are (a) susceptibility of certain vital parts to damage by bombs carried by aircraft; (b) grouping of coast defense artillery too close together to prevent attacking vessels which have once gained control of the sea and air from reaching positions that will permit firing on the Miraflores Locks; (c) lack of sufficient aircraft in canal defenses to insure immunity from attack by enemy bombers should a base be obtained within striking distance; (d) the necessity for more complete liaison between the army and navy forces, especially in communications, information concerning enemy forces and means for recognizing same.

"Second—The necessity for dissemination of information to our own forces. Where information is necessary or desirable in order that our own forces may act intelligently this information must be disseminated even at the risk of the enemy obtaining it.

"Third—The need for improving our fleet communcations, both radio and visual.

"Four—The necessity for balancing our fleet by the addition of scout cruisers and destroyer leaders.

"Fifth—The necessity for having a sustained speed of at least twelve knots for fleet submarines and all auxiliaries that accompany the fleet.

"Sixth—The necessity for more maneuvers of this nature for fleet training.

"Seventh—The necessity of denying to any possibly enemy a base within aircraft striking distance of the canal.

"Eighth—The desirability of studying the question of establishing by suitable treaties aircraft base or bases at points within striking distance of the canal.

"Ninth—The necessity for looking ahead as to the probable and possible developments in submarines and aircraft.

"The performance of our eighteen seaplanes in making the long trip from Hampton Roads to the Canal Zone and the performance of our submarines in making the 3,000-mile trip from San Diego to the Canal Zone shows the possibility of a future enemy being able to bring to our shores both air forces and submarine forces from distances considered impracticable and the need for the further development of our own air and submarine forces."

"All of you gentlemen, being familiar with our own governmental policies and the international situation," Admiral Jones told the Congressmen, "undoubtedly appreciate that should another war come the Panama Canal is destined to play a most important rôle. The canal would undoubtedly be the objective for attack by any probable enemy so long as that enemy feels that there would be the slightest chance of success. This being conceded, it behooves the country to put the canal defenses on a plane that will insure defeat for any enemy who may attack."

Points in the Problem

In the canal attack problem the Scouting Fleet, formerly the Atlantic Fleet, under command of Vice Admiral McDonald had the task of defending the canal, and was known as the Blue fleet. The Battle Fleet, formerly

the Pacific Fleet, under command of Admiral Eberle, had the rôle of an enemy force. This was called the Black Fleet.

The general situation, known to the commanders of both fleets, was that strained relations between Black and Blue had recently been made more tense by a cruise of a Black Fleet in the Eastern Pacific. This Black Fleet, under command of Admiral Eberle, consisted of seven battleships, thirty-eight destroyers, two destroyer tenders, nine submarines and one sub-tender. After visiting ports on the west coast of South America, this fleet assembled on January 26 at Galapagos Islands, where they were joined by the Black base force with train, and by a number of fuel and cargo vessels under other flags. After repair and fueling, the entire Black Fleet, including base force and train, sailed from Galapagos Islands on February 16 with the announced intention to visit Magdalena Bay and Blue Pacific ports.

The Blue Government, in view of the threatening situation, had ordered the majority of the ships of the Blue force, which was superior to the Black Fleet, to Atlantic Coast yards, where the ships were undergoing overhaul preparatory to a southern cruise in March. The remainder of the active Blue Fleet had passed through the Panama Canal and was based on Balboa. This Blue force, under command of Admiral McDonald, consisted of eight battleships, twenty-six destroyers, one old cruiser, one destroyer tender, sixteen submarines, three sub-tenders, a mining force and an air force of nineteen planes. The Blue Army air force had been assembled in the Canal Zone. The Blue Submarine Divisions regularly assigned to the Coco Solo submarine base at the north end of the canal had been placed on a war status.

Information Known to Commanders

In view of strained relations, Admiral E had received instructions that in the event of war the general plan for the Black Naval Forces would be to take the "offensive-defensive," and that he was to render the Panama Canal useless through destruction of the locks or dam, or obstruction of canal or approaches.

While at the Galapagos Islands, Admiral E learned that a large Blue Air Force of scouting and fighting planes was at Panama about February 25, that it was common report that another destroyer squadron would arrive about February 19, and that two Black plane carriers, each carrying sixteen bombing planes, had left their base January 24 to join him. On February 18 when the Black plane carriers had joined him Admiral E received a radio despatch from the General Staff saying, "Execute your war mission. There will be no general declaration of war."

For the Blue commander there was given this special situation: Vice Admiral M, commanding fleet detachment at Balboa, the Commandant of the Canal Zone naval district and the Military Governor of the Canal Zone had been previously informed that the Blue Government was convinced that the purpose of the Black Fleet was to render the canal useless. Reinforcements had been ordered for the canal, of which fifty fighting planes, twenty observation planes and ten bombers were expected to be in the Canal Zone ready for service by daylight of February 25.

On the morning of February 17 Admiral M, the Military Governor and the Commandant of the Canal Zone received a dispatch from the Chief of Naval Operations and Chief of the Army General Staff informing them of the position of the Black fleet, that the situation was critical, and that the Blue Government had decided the presence of the Black Naval Force east of longitude ninety degrees west would be conclusive of hostile design against the canal, which must be frustrated. "On that basis act immediately to safeguard Panama canal" was the order.

The assumptions were that the Panama Canal was strongly fortified by heavy guns to a range of 20,000 yards and by six-inch guns and smaller caliber to a range of 12,000 yards from the line Tobago Island to Flamenco Island, that Blue land forces in the Canal Zone consisted of 10,000 troops, fifteen observation planes, four mine-layers and 1,000 controlled mines, and that Blue naval district forces in the Canal Zone consisted of sixteen submarines, six tugs, twelve motor boats and ten observation planes.

Galapagos Islands and Cocos Island were denied to the Black fleet and their use prevented by neutral nations, but the Central and South American countries in the vicinity of the canal were assumed not to be able to effectively resist Black use of a Pacific Coast base in their territory.

Air Attack Decided Best

In drawing up their estimates both commanders considered the possibilities of blockading the canal by an attack in force on the Pacific side defenses and locks. Blue rejected this idea as improbable on Black's part, believing the heavy fortifications would keep his ships at bay, and even should he reduce these he would still have a mine field, a submarine entrance guard and an air attack to overcome. Black rejected this course because he thought that to destroy the closest locks by bombardment or torpedoes ships would first have to destroy the Blue sea forces, run the gauntlet of the mines and submarines in Panama Bay, and even after this was done shore batteries would still keep Black forces, he believed, at a range of 36,000 yards, to which distance destruction of the locks by bombardment was considered hardly possible.

After consideration of the blockading of the canal entrance by sinking ships, both the Black and Blue commanders estimated that the best chance for Black to accomplish his mission was to bomb the vital parts by means of airplanes. Blue decided that Black's most probable intention would be to establish a base on the Central or possibly South American coast. The Black commander came to the same conclusion. Culebra in Costa Rica was chosen for the Black base. It is 550 miles by water from the Pacific entrance to the canal. By air line across the mainland of Costa Rica it is 350 miles to Gatun Dam. By way of Lake Nicaragua and the San Juan River Valley it is 385 miles from the dam. Planes with 800 miles radius could make the round trip by following this route.

Black decided to launch the surprise attack from a protected anchorage at Culebra Bay by flying from that point to the Gatun Dam and spillway. If the Gatun Dam were damaged, the Black commander decided, the canal would be put out of commission for a longer period than if the locks were damaged, as a break in the spillway or Gatun Dam would empty Gatun Lake, and even after the dam was repaired it would take a long time for the lake to fill so the canal could again be used.

The Blue commander reported that on February 20, not having sighted the enemy, he decided that the Black force would approach the coast either by the southern flank or on the northern flank. So he sent a radio to the commander of the Blue destroyer fleet to send six northern scouts immediately to examine the coast as far north as Fonseca Bay. This resulted in the first sighting of any of the enemy forces on February 21 about forty miles off shore. That afternoon the Blue destroyer *Coghlan* reported the enemy entering Culebra Harbor.

During this interval six northern Blue destroyers were concentrating and three submarines were moving toward this area from Salinas Bay. One of the Blue airplanes claimed to have bombed the *Oklahoma* and one of the Blue submarines to have torpedoed two of the Black battleships.

When the Black forces arrived at Culebra the problem was discontinued. The Black fleet arrived off Culebra within the limit of time contemplated

in its plan. When the problem was discontinued the Black force was securing itself at its base and making preparations for the flight of the bombers to Gatun Dam and spillway.—*New York Times*, 8 April, 1923.

THREE MAIN LESSONS FROM PANAMA MANEUVERS.—By Frederick C. Hicks, Representative from New York, Member Naval Affairs Committee.—The maneuvers of 1923 are over and are now a part of our naval records. For the first time in the history of the United States Navy our sea force, united under one command, has worked battle problems and fleet tactics. Fifteen of our dreadnaughts and some seventy destroyers with submarines and auxiliary craft, composing the Atlantic and Pacific fleets, have operated as one fleet. Great credit is due Admirals Jones and Eberle and all the officers and men for the successful manner in which the operations were carried out. As details of the work have been published in press reports, I will endeavor to point out the chief lessons learned and present the arguments in favor of a continuation of our present naval policy. Three points stand out prominently.

First, the necessity of making these maneuvers a part of our naval practice. In order that the fleet may operate smoothly and effectively, with each ship in proper position, it is of prime importance that these joint maneuvers be held at frequent intervals, for it is only by actual practice in peace times that experience will be gained which in war times would enable the fleet, acting as a unit, to fight at the maximum of its power. Problems may be solved on paper; great operations may be successfully executed in theory, and while this class of experiments has its value, yet it is only by working the ships themselves in fleet formations and under conditions approximately those of battle that a high degree of efficiency can be attained.

Lack of Practice Shown

While the maneuvers were entirely satisfactory, there was a raggedness, due to lack of practice, which, if repeated in actual conflict, might lead to disastrous results. To bring the fleet up to the highest point of efficiency, to accustom officers and men to work their individual ship as an integral part of a greater unit, it is therefore essential that maneuvers of this character be held frequently.

To accomplish this result, it is necessary that ample supplies of fuel be provided. This involves the appropriation by Congress of funds for the purchase of large stocks of oil and coal. While the amounts involved are naturally heavy, the objective is of such vital importance that it fully warrants the expenditure and our national legislators should not hesitate to vote the funds.

The second outstanding feature was the lack of light cruisers. This type of vessel is absolutely essential for a well-balanced and properly rounded out navy. At present we are deficient in these ships while Great Britain and Japan are both amply supplied with them.

The functions of a cruiser may be described as follows: First, the service of information, scouting; in other words, searching for the enemy fleet and finding out what it is doing. Second, screening; that is, guarding our fleet against surprise and keeping off the enemy scouts. Third, in battle, supporting our destroyers in their torpedo attacks against enemy battleships and beating off enemy destroyers. Fourth, operating against enemy shipping and protecting our own shipping against enemy raiders.

Need of Light Cruisers

Of modern cruisers of 3,000 to 10,000 tons, the construction of which are permitted by the treaty without numerical or total tonnage limitation, the United States is building ten to have a speed of over thirty knots and a

total tonnage of 75,000, while the British have or are building to a total of forty-eight with an aggregate tonnage of 252,990, and the Japanese twenty-five with a total tonnage of 157,730. This disparity between our cruiser strength and the cruiser strength of the other powers should be corrected by the laying down of additional ships. This will accomplish two purposes:

First, it will give to the present fleet a strength in cruisers proportionate to the capital ship strength permited by the treaty under the ratio agreement and add that element of strength which the navy now lacks.

Second, by possessing a large number of cruisers, it will enable us in case a conference is called for the limitation of auxiliary combat ships, to obtain a ratio of equality with any other power. Undoubtedly ships in hand will be used as a basis for determining this ratio, and so it is imperative that we build up our cruiser strength as we built up our capital ship strength under the 1916 program.

Secretary of State Hughes said in his New Haven speech:

"Personally, I am strongly in favor of maintaining an efficient navy up to the treaty standard. This does not involve any injurious competition in battleships, but simply makes possible the work and equipment which maintain the security and relative position contemplated by the treaty. There is another reason for this course. If we enter another conference, we should have an assured basis for a proper agreement by maintaining our existing relative strength. We have established a fair ratio based on existing strength as it stood at the time of the conference, and this ratio should not be altered to our prejudice. As to light cruisers, the United States is not as well supplied as it should be, but the treaty does not interfere with adequate provision by the United States to supply this want, and it should be supplied."

Third, the necessity of having an enlisted personnel of sufficient strength to man every station on board ship. Owing to lack of training ashore, it frequently happens that a ship must carry a number in excess of her complement, which means loss of man power. This is due to rapid flow of men through the service; at the present time the re-enlistments average only about sixteen per cent, so the navy must constantly take on new men. A constant shifting of crews is always a detriment and it is hoped that this defect may be overcome by a change of the existing enlistment law.—*New York Times,* 15 April, 1923.

THE NAVAL DANGER AT PANAMA.—The ominous drone of a double-engined night-bomber flying over the Gatun locks would be the first news to Americans guarding the Panama Canal that war had been declared on us by any foreign country. This is the opinion of Major-General Samuel D. Sturgis, in command of the military defenses of the Canal Zone, in a recent interview given the representatives of various newspapers present at Balboa.

The immediate occasion for this disquieting revelation, we are told, was the recent naval maneuvers at which two attacks made on the Canal would have resulted (in actual war) in its being crippled for a period of years. One of these was when the "Black Fleet," representing the mythical enemy, slipped by the defensive fleet and reached an anchorage in Port Culebra, north of the Canal on the Coast Rican coast. This fleet was supposed to have two large airplane carriers which could then have easily dispatched their 150 planes along the Nicaraguan Canal route to the Atlantic, down to the Atlantic entrance of the Panama Canal and over the Gatun locks. It has been pointed out that several navies of foreign Powers have sufficient airplane carriers and planes to make such an attack. The results of the maneuvers are said to have been a shock to Secretary of the Navy Denby, Admiral Coontz and the visiting members of the Senate and House.

The force of this conclusion is brought home by Carter Field, writing in the New York *Tribune* of the Canal's air defenses:

"There is not a fighting plane now in the entire zone. At present, with no fighting planes, there are only sixteen observation planes and four bombers. There should be more of both, as well as fighters, in the opinion of Army and Navy experts.

"The anti-aircraft gun defenses are in pitiful shape. There are only thirty-six guns mounted on the sixty-six locations considered vital. The Army has the guns, but not the men.

"More than that, there is not a searchlight stationed near an anti-aircraft gun except in the forts defending the two entrances. Yet the most simple possible attack by hostile aircraft would be not on these forts, but on the locks, the smashing of which would cripple the Canal."

Concrete suggestions from military experts include:

1. Replacing one obsolete 16-inch gun on Perico Island at the Pacific entrance of the Canal, with two 16-inch guns.
2. Four other 16-inch guns on Taboga Island, eight miles further out in the Bay of Panama, to guard the approach.
3. Four 16-inch guns on the Atlantic side to guard the entrance as well as Gatun Locks, nine miles inland.
4. One hundred to 150 scouting and bombing airplanes with the necessary personnel to maintain them for defense.

Interviews given out by General Sturgis to the Chicago *Tribune*, New York *Tribune*, New York *Herald* and other papers summarize the situation from the Army as well as the Navy point of view. We quote from the New York *Herald:*

"The result of this defense will be to establish an intermediate zone at the canal mouth to protect the American naval force going out to meet the enemy. Without such protection the enemy in a T formation outside the range of our present guns could pick off ship after ship as she emerged from the Canal."

Widely varying views were expressed by our newspapers. The New York *World* takes the information somewhat ironically:

"It is a terrible catastrophe to contemplate. The only way of escape seems to be through unlimited appropriations. But even before that can be done it will be necessary for everybody to work himself into a state of panic over the Panama Canal."

At any rate no one can accuse Americans of thinking in terms of war, points out the Milwaukee *Sentinel*, since it is now obvious that the United States is taking much greater risks than any of the other signatories to the disarmament treaty. For:

"The defensibility of the Panama Canal, making it possible for the American fleet to act as a unit, is the basis of the five-five-three ratio. If the canal is 'by no means a Gibraltar,' such a danger evidently upsets the naval ratio."

Perhaps the greater number of editorials arrive at some such conclusions as this of the Philadelphia *Inquirer:*

"There is not yet a sufficient realization, even among military and naval authorities, of the overwhelming part that aircraft will play in the battles of the future. We still talk of preparation in terms of ships and land guns. They are not obsolete by any means. But it is becoming more and more plain that the first line of attack or of defense hereafter will be in the air."—*The Literary Digest*, 14 April, 1923.

SIDELIGHTS ON AMERICAN NAVAL POLICY.—A candid and well-informed exposition of American naval policy is contributed to the March number of the *Fortnightly Review* by Mr. William H. Gardiner, vice-president of the Navy League of the United States. It appears that an article by

Mr. Archibald Hurd, in a previous issue of the *Fortnightly*, containing observations on the Washington Naval Treaty and its effect on the future relative position of the leading navies, has given rise to adverse comment in the United States, where it is held to have misinterpreted the original American proposals for naval limitation and inaccurately pictured the post-Conference programs of auxiliary men-of-war. The present article is, therefore, in the nature of a reply to Mr. Hurd, though occasion is taken to explain and justify the whole trend of recent American policy in relation to sea armaments. Incidentally, Mr. Gardiner mentions, and disposes of, a suggestion heard "in certain quarters" that the big ship-building program adopted by Congress in 1916, consisting as it did mainly of capital ships and making no special provision for anti-submarine craft, was designed with a view to helping Germany. This is the first we have heard of any such strange suggestion, and we are certain that it never occurred to any rational person in England. It is true that President Wilson, in February, 1917, speaking of the Great War, remarked to a Cabinet colleague that "he (the President) didn't wish to see either side win—for both had been equally indifferent to the rights of neutrals—though Germany had been brutal in taking life and England only in taking property"; but however much we may disagree with Mr. Wilson's policies, no one on this side of the Atlantic credited him with a desire to see Prussianism triumphant, much less with an intention to give it the support of American arms.

Mr. Gardiner makes it clear that for some years past the eyes of American strategists have been fixed on the Pacific, not on Europe, and that they take a far graver view of the possibilities of eventual conflict in the Far East than has been realized in this country. This helps to explain why the Anglo-Japanese alliance caused so much uneasiness in the United States, and why the prospect of its renewal led to some very plain speaking by the American Press. We are told that, Lord Curzon's proposal for a formal renewal of the alliance having been "virtually vetoed" by Mr. Meighen, the Canadian Premier, the British Government was saved from "the dilemma of having to choose between breaking with Canada over a major matter of foreign policy or breaking with Japan" by the American invitation to the Washington Conference. Unless we are greatly mistaken, however, the renewal of the Japanese alliance was in doubt long before Mr. Meighen had spoken of it or the American Government had resolved to summon a conference. There was a widespread feeling here that the alliance had outlived its utility, and an influential section of our own Press was calling loudly for its termination. But if the British Government was in a dilemma, so also was the American, on Mr. Gardiner's showing. "On the one hand, there was a most positive demand for retrenchment in American federal expenditure, and there was emotional clamor for disarmament, such as has followed every great war supposedly fought to end war. On the other hand, there was detailed, specific, and conclusive evidence of a technical nature that intensive preparations were being made looking to war in the Pacific in 1924." Thus the American Government's dilemma was "between the fiscal and pacifist aftermath in the United States of the European war, on the other hand, the specific imminence of a Pacific war on the other." We believe that this American writer does not exaggerate the acuteness of the Far Eastern situation in 1921, though most of us here were too preoccupied with our post-war problems to realize what was brewing on the other side of the globe.

Coming down to the main issue between Mr. Gardiner and Mr. Hurd, this refers to the scope of the initial American plan of naval limitation, which, according to Mr. Hurd, did not go beyond capital ships and aircraft carriers. In fact, however, the plan embraced all types of fighting craft, and was only narrowed down to big ships after it had become evident that an agreement could not otherwise be reached. Credit is certainly due to the

American Government for having proposed a comprehensive and sweeping reduction of all naval material, from dreadnaughts to submarines. The other of Mr. Hurd's statements now challenged was as follows: "The only countries which have laid down such vessels (cruisers and submarines) since the end of the war are the United States, which has a large program in hand, Japan, France, and Italy, but the last-named countries' programs are extremely modest." It is evident that a slip of the pen occurred here, as Mr. Hurd cannot but be aware that the Japanese post-war program, so far from being "extremely modest," is decidedly ambitious. That country, indeed, is now engaged in building more cruisers than all the Powers combined, and has laid down eight such vessels since the Conference ended, while her submarine construction is on an equally generous scale. When we find that during the last five years she has built or ordered twenty-three light cruisers, as against a collective total of sixteen for Great Britain and the United States, there can be no question as to which country is setting the pace in "auxiliary" naval construction. In affirming the natural and desirable alignment of the American and British navies to be side by side, Mr. Gardiner expresses a sentiment with which we in this country cordially agree. Sympathy and co-operation between the two nations form the strongest guarantee of future world peace.—*Naval and Military Record*, 14 March, 1923.

MERCHANT MARINE

NEW SHIPPING BOARD POLICY.—A new shipping policy based upon the determination of the Administration to keep the American flag on the seven seas—either by sale of existing Government ships and routes to private operators or by direct Government operation and ownership—was enunciated both from the White House and the Shipping Board today.

From the White House came the announcement that after conference with the Shipping Board the President has concurred in the program that "the chief end to be sought is the establishment and maintenance of an American merchant marine." The White House announced that with the failure of the Administration's Ship Subsidy bill the Shipping Board has on its hands its vast possessions of ships as well as heavy losses under the present plan of allocated operations by managing agents.

If these managing agents will turn to now and buy the Government vessels and guarantee to maintain service the Government is willing to go out of the shipping business. If these potential purchasers hold aloof and fail to make satisfactory bids, then the Government, with an available appropriation of $50,000,000 for ship operations in the next fiscal year, will operate its own ships and a year or tko from now ask Congress to define a national shipping policy.

Meanwhile, so far as the resources and appropriations in hand go, the Administration intends to keep the American flag afloat on the seas.

President Harding's statement was supplemented with details in a conference Chairman Lasker had with newspaper correspondents afterward. Succinctly, the Administration program is this:

The President, Chairman Lasker and the Shipping Board long have been opposed to outright government operation of ships, but they will adopt this plan rather than see the American merchant marine die because of failure of the Ship Subsidy bill in Congress, or the failure of American operators to bid for vessels.

Chairman Lasker thinks the Shipping Board has too many routes under the arrangements with agents. Operating agents originally numbered about eighty; Mr. Lasker reduced the number to thirty-nine, and he thinks eighteen to twenty-five would suffice.

Trade routes and ships and these reduced number of agencies are to be offered for sale, but if these "potential customers," who have been operating do not fulfill the bidding expectations of the Shipping Board, then the Government will call everything quits and run its own lines of cargo ships. Pessenger routes are incidental and not materially involved.

Preceding Chairman Lasker's explanation of its fuller meaning, the White House issued a statement after the Shipping conference. About a year ago the President indicated his disapproval of rolling up further deficits in shipping operations, but it appears today that the Administration is willing to make an exception so far as the appropriation for the next year is concerned.

The White House statement reads:

After an extended conference with the full membership of the Shipping Board and a thorough discussion of the problems to be solved, the board unanimously agreed, with the President's concurrence, that the chief end to be sought is the establishment and maintenance of an American merchant marine. With the failure of the Subsidy act the board is confronted with its vast losses under the existing plan of allocated operations under managing agents.

In compliance with the shipping act the board will proceed at once to the consolidation of foreign trade lines, and then offer the sale of these lines and ships under the authorization of the law, conditioned on suitable guaranty of maintained service. If such sales cannot be made without justifiable sacrifice of the ships, then the Government will proceed to direct Government operation aggressively pursued. In short, there is unanimous agreement that the existing law contemplates and authorizes an adequate and maintained American merchant marine, and such a course will be followed as will fully guarantee it and contemplate its larger development.

Will Not Sell Cream of Routes

Elaborating upon the White House statement Mr. Lasker said:

"If within the next few weeks we cannot get satisfactory offers from the private operators we have encouraged as potential customers—and we do not mean to sell three or four cream routes and leave the Government holding the bag as to the rest—we shall carry out the program of government operation and answer the question 'how shall America stay on the high seas?'

"Nobody hates Government ownership and operation more than I do. I have been consistently against it and so has the board and the President, but the board and I finally have recommended in view of the present situation that we cut out doing business on the cargo lines through agents and go direct and on a larger scale to Government operation.

"We feel that if we cannot sell our ships with guarantee of service to operating agents whom we regarded as potential customers, then the alternative is Government operation, because, after all, the main thing is the maintenance of an American merchant marine. We do not intend that the American flag shall go off the high seas.

"Congress refused a subsidy to private shipping. You all know the history of that fight and how the Administration and I believed it was the solution to the shipping question. However, while it failed to approve the so-called Ship Subsidy bill, Congress did appropriate after only a few minutes' debate $50,000,000 for the operations of the Shipping Board for the next fiscal year, beginning July 1. We have that $50,000,000, and intend to use it to keep the American flag afloat, and for the first time to put into effect an aggressive campaign of ship operation by the Government.

"The President and the Shipping Board are determined to use this opportunity to the end that America shall not only be free on the seas, but shall adequately play its part in the commerce of the world.

"All shipping companies, under any flag, seem to be losing money now, but this Government cannot leave the seas to foreign competition. I want to say that no service now given by our operators will be interrupted if it becomes necessary for the United States to take over operation of its own account. . . .

"The point I want to make is this—that so far as American and foreign shippers are concerned and so far ahead as anyone can see in this generation it will be possible to ship on American vessels."

Mr. Lasker said that Shipping Board's direct appropriation of $50,000,000 for the next fiscal year would tide it over that period of Government operation, if the Government must go whole-heartedly into the shipping business, because the operators would not purchase its vessels, and he admitted the outlook seemed poor for purchase. Outside of that, he said, the Shipping Board would go to Congress next December and ask for a construction appropriation to put more specialized cargo ships into operation. However, he said, this appropriation was not vital and the board could get along, although the appropriation was desirable.

Chairman Lasker plainly indicated that American vessels would not be sold at a sacrifice. Rather than that, he said, the Government would go into the business of operation on a large scale. He also suggested that a year or two of Government operation might do two or three things, including stabilization of the shipping business and the convincing of foreign nations that the American flag is not to be driven off the seas despite the defeat of the Ship Subsidy bill.

Willing to Settle at Market Price

The Government is willing to sell at "market price" any of its vessels with maintenance of service guaranteed, Mr. Lasker said. He recited that twenty-three oil tankers of the few hundred of tankers in service have been sold unconditionally at market price within recent months. However, operators who buy at less than market must give guarantees.

The Shipping Board chairman admitted that preliminary reports about the intention of "potential customers" to purchase the ships they had been operating were pessimistic. He hoped the ships would sell, but added that "the bids of the next thirty days will tell the story."

The operators, he said, might be bluffing. If they are not bluffing and intend to hold aloof as bids are called for, then, Mr. Lasker said with approval of the Administration, the United States, under the authority of the Jones bill and the $50,000,000 already voted by Congress, will go ahead and really begin government operation of a merchant marine and keep it up until a national shipping policy is enunciated by Congress or the American nation determines that it wants to get off the seven seas.

Later Mr. Lasker said that in the event the Government finds it necessary to embark on a straightout program of Federal Operation, the Shipping Board would be prepared to go before Congress in December and ask a substantial appropriation for replacement construction.

The chairman made it plain that in the plan considered by the conference today an important feature was provision for new tonnage, built in American yards, to maintain a surplus, "as a notice to competitors that the American people intend to keep at sea."—*Baltimore Sun*, 15 April, 1923.

OUR SHIPPING MAKING PROGRESS.—The recent conferences held in Washington at the instance of the Shipping Board's Policy Committee revealed that our shipowners and shipbuilders are still of the opinion that, without some form of Government aid, no privately owned American merchant marine of any size can be established on an enduring basis. Under existing conditions it is difficult to prove or refute the correctness of this as-

sertion. On account of the preemption of the field by and the withering competition of Government tonnage, American privately owned vessels have been unable to establish themselves on the trade routes of the world. One fact is certain, however: that our merchant marine has been forging ahead for the past year without any direct Government aids and despite the existing acute shipping depression. The turn in the tide occurred in March, 1922, since which month the proportion of our water-borne commerce carried in American bottoms has risen almost uninterruptedly. According to the latest available tonnage statistics, thirty-eight per cent of our combined imports and exports in November last were carried in American ships, as compared with only thirty-two per cent in the corresponding month of last year. Again, American vessels entered and cleared at United States ports in the foreign trade totaled 6,643,988 tons in November, 1922, as against 5,721,879 tons in the same month of the year preceding. Both actually and relatively, therefore, our shipping is making distinct progress. All this is very gratifying to those who believe that given a fair opportunity and freed from vexatious restrictions, American-flag vessels can compete successfully for a goodly share of the overseas carrying trade even though denied help from the Government.—*Nautical Gazette*, 14 April, 1923.

ENGINEERING

ELECTRIC SHIP PROPULSION.—The paper by Mr. W. Le Roy Emmett on "Electric Ship Propulsion," taken on Thursday afternoon, the twenty-second ult., and read in the absence of Mr. Emmet by Mr. Bevis P. Coulson, Jr., opened up another discussion. See *The Engineer* for 6 April, 1923.

Engineer Vice Admiral Dixon said that the application of electric propulsion to warships had not been overlooked by the British Admiralty, but the decision had been reached that the case for electric propulsion had not been established. With regard to the claim for improved economy of operation, that was not the first consideration in the case of warships, and it was obvious that the installation of machinery of greater weight must lead to disadvantages from other standpoints unless the additional weight occupied by the machinery was counterbalanced by a corresponding saving in the weight of fuel carried. Experience in the British Navy indicated that the geared turbine could, for all practical purposes, be made as efficient as electric propulsion. The question of the extra space occupied by electric machinery, which had not been dealt with by Mr. Emmet, was a vital consideration in the case of a warship, the design of which was a compromise between opposing factors, and where every foot of space had to be most carefully considered, as it might mean the sacrifice of an important fighting or defensive feature. It would seem that electric transmission plant, as compared with the geared turbine drive, required an additional floor space of not less than twenty per cent. It was true that against that it was argued that electric transmission enabled a greater subdivision to be made of the machinery, but from the naval standpoint the advantages claimed under this head were more apparent than real. It could be said in favor of the geared turbine that it had come with a successful record out of the trial and stress of the naval war, and although the advance of electric propulsion for ships would be watched with interest and taken into consideration when new ships were being designed for the Navy, in its present stage of development it would seem that its disadvantages outweighed its advantages in the case of warships.

Sir Thomas Bell said that Mr. Emmet was to be congratulated on his courage in embarking on the wholesale manufacture and intensive production of machinery, of which he had had no very definite or extended ex-

perience. The firm with which he (the speaker) was connected had fitted double reduction-geared turbines in three large passenger ships which had been in service for some time, and in two other passenger steamers had installed single reduction-geared turbines. Their experience had been satisfactory, and from knowledge of performance gained under service conditions he took exception to the statement of the author that low-speed turbines could be more safely and easily operated through gearing than high-speed turbines. He was unable to see what advantage in the case of passenger ships could be claimed for electric propulsion.

Sir Eustace d'Eyncourt said that having regard to the conditions which were laid down by the Washington Conference any economy arising from the adoption of the electric drive, which might be associated with cruising speeds was of no importance, while it was clear that the extra weight of electrical machinery as compared with geared turbine plant must reduce the fighting qualities of the ship. Reference had been made to the additional space required for electrical plant, and it had been found in a provisional design which had been got out for a warship, that to compensate for the extra space required it would have been necessary to encroach considerably on the magazine space, which, of course, put electric propulsion out of court.

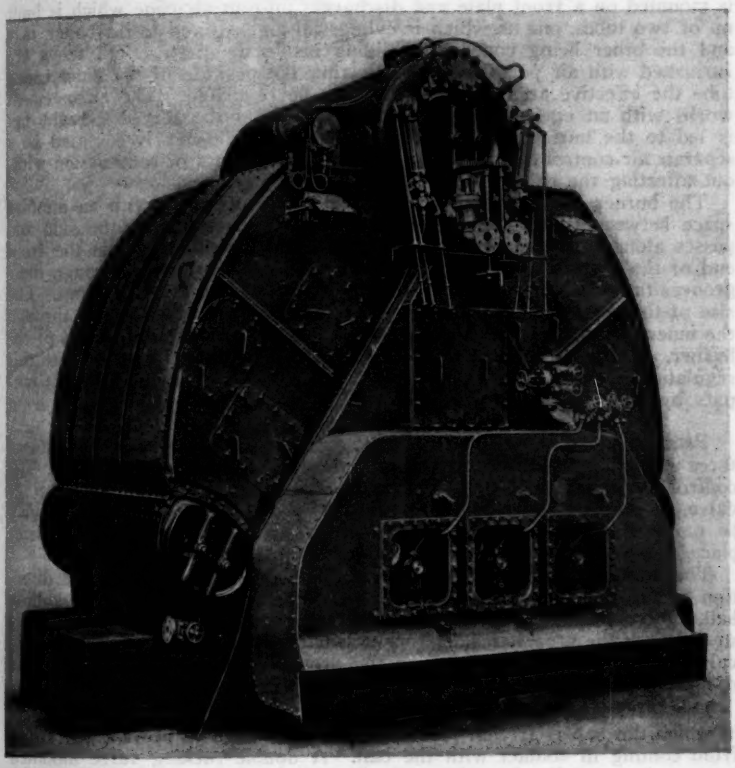
Mr. Robert J. McLeod said that at the beginning of last year he had made a visit to the United States and had been given an opportunity of inspecting the electrical equipment of the newer battleships and cruisers, and of discussing the whole question with American naval officers. He had also spent some time with Mr. Emmet and the engineers of his company at Philadelphia and Pittsburg. He was able to say that every naval officer in the United States service was enthusiastic on the subject of the electric drive for warships, and he had heard of none of those troubles such as were associated with mechanical gearing. If he might suggest an explanation of the small percentage of failures of gearing in warships as compared with merchant ships, it was that while warships ran only occasionally at full power, merchant ships were driven at full speed for the greater part of the time they were at sea, and the stresses on the gearing were, therefore, of a continuous character. The weight and space question had been raised in connection with the electric drive, but he would point out that in the United States they had designed their new ships from first principles, and reduced the machinery weights to a greater extent than might seem possible to those who had only a cursory knowledge of the subject. He would like a definite comparison by British engineers who were opposed to the electric drive to show what they could do to compare with the hypothetical ship laid down by Mr. Emmet. It could not be disputed that with the electric drive boilers and generators could be placed in a more convenient position in the ship. The question of reversing was of some interest in connection with the electric drive, as reversing could be carried out more simply, and it was an advantage that a higher degree of superheat could be used with the electric drive and turbines always running in one direction than in a system which made the use of reversing turbines necessary. He had come to the conclusion that the geared turbine must be less efficient than the electric drive. The work done in the United States had proved the greater reliability of this system for large ships owing to the plurality of the units. Personally, he had very little doubt as to the future of the electric drive, and he was the more convinced of its superiority to any other system from the fact that the cost of upkeep of the electrical equipment in the United States warships had been practically negligible. He would like to see two sister ships built, one fitted with the electric drive and one with the geared turbine, and a series of comparative tests carried out.

Commander S. V. Goodall said he had been at sea in the *New Mexico*, the first electrically-propelled battleship, and he had been all but persuaded of the superiority of electric propulsion as compared with geared turbines. At that time the fuel consumption for the battle cruisers of the *Lexington* class, which was guaranteed by the contractors, varied from .98 lb. of oil per shaft horsepower per hour at full speed to 1.20 lb. at 19 knots, these figures being the consumption for all purposes. Mr. Emmet was now prepared to guarantee a figure of .85 lb. at 19 knots and full speed, but even this great improvement in fuel consumption did not establish the case for electric propulsion in warships, as the saving in fuel did not compensate for the increase in machinery weights. Taking Mr. Emmet's figures he had worked out the effect on the recently scrapped battle cruisers of adopting electric propulsion. A veritable rake's progress was the result. The engine rooms had to be longer, the horsepower increased, the weight of armor therefore increased, and the size of ship increased. Calculations showed that the vessels would have been 50ft. longer, the light displacement higher by 3,500 tons, and as the result it would have been impossible to dock the ships at either Portsmouth or Rosyth. He had also worked out a scheme of electric propulsion for the new capital ships *Rodney* and *Nelson*, and found that the ships would be 20ft. longer and the displacement 1,000 tons in excess of the limit fixed by the Washington Treaty. It was obvious that unless the weight and space of electric machinery could be very much reduced, the death blow to electric propulsion for warships had been given by the Washington Treaty.

Mr. Bevis P. Coulson, Jr., in replying on behalf of the author to the points raised in the discussion, admitted that weight and space questions were of great importance and required to be discussed in detail. There was no doubt that electric propulsion was gaining ground. Following the construction of the *San Benito*, a 3,000 shaft-horsepower ship, equipped with electrical machinery, three vessels of the same type had been ordered by the United Fruit Company. The Japanese Government had just taken delivery of an electrically-propelled collier, and he felt confident that the electric drive would be generally adopted in the Japanese Navy. Comparisons were available of the electric drive with the geared turbine. It had been shown in regular trials that the maneuvering qualities of the *New Mexico* were vastly superior to those of the geared turbine ships *Idaho* and *Mississippi*. The fuel consumption of the geared turbine ships also compared unfavorably with that of the *New Mexico*. At 10 knots they consumed twenty per cent more fuel, at 15 knots, forty-two per cent more fuel; at 16 knots, forty-seven per cent more; at 19 knots, forty-per cent; and at 21 knots, thirty-two and two-tenths per cent more fuel. Reference has been made to the weight question. If an Atlantic liner similar to the *Empress of Canada* were taken, it would be found that the large double-reduction gears weighed 200 tons, which was about 37 lb. per shaft horsepower, and the weight did not include the four turbines. Electrical equipment would compare favorably with that figure. On the question of the space occupied, he was able to state that in the case of the *California* the machinery spaces had been narrowed to a degree which enabled 300 tons to be saved in armor plating. On the weight question, he would also point out that there was a big saving in piping with the electric drive as well as a saving in shafting, as the motors could probably be put nearer the stern of the ship. In America they were convinced of the advantages of the electric drive, and could not understand the objections which had been raised by British engineers. Unfortunately, or fortunately, as the case might be, it would not be possible to test the fighting qualities and military advantages of the electric drive compared with other methods of propulsion, unless there was a war between Great

Britain and America, and he prayed that that might never happen.—*The Engineer*, 6 April, 1923.

YARROW WATER-TUBE BOILER WITH KERMODE SYSTEM OF OIL-FIRING.—An interesting installation of the Kermode system of oil fuel burning is illustrated in the figure below, which shows a Yarrow water-tube boiler fitted with three Kermode pressure jet burners, each of which is carried in an independent air-control casing. The boiler, which has 2,000 sq ft.



Yarrow Water-Tube Boiler

of heating surface, a working pressure of 200 lb. per square inch and an evaporative capacity of 18,000 lb. an hour, was constructed and equipped as shown in the figure by Messrs. Wm. Denny and Brothers, Limited, of Dumbarton, and is fitted to a fire and salvage boat built by Messrs. Merryweather and Sons, Limited, of Greenwich, for the Port Authorities of Rangoon. The dimensions of the vessel are 109 ft. 6in. overall by 20 ft. beam by 8 ft. 6 in. depth, and the draught is 6 ft. 6 in. The propelling machinery consists of two sets of triple-expansion engines with cylinders 10 in., 17, and 26½ in. diameter by 16 in. stroke, capable of developing 800 i.h.p., and driving twin screws. A speed of 13-18 knots was obtained on the sea trials as a mean of several runs over the measured mile,

although the trials were carried out in very bad weather with a heavy gale blowing. This speed was 1.7 knots over that contracted for and was improved on by a run up and down the Long Reach measured mile, on which a speed of 13.32 knots an hour was obtained.

The Kermode burners are of the pressure atomizing type and are supplied with fuel oil by direct-acting steam pumps installed in duplicate. A complete system for heating and filtering the oil is also fitted, as well as a fan driven by a high-speed steam engine for the air supply. Each burner is mounted on a front plate and discharges into an air-cone which is built up of two tubes, one of which is cylindrical and is fixed to the boiler face and the other being coned and sliding inside the first. Both tubes are furnished with air ports, and by adjusting the position of the inner coned tube the effective area of the ports may be regulated. The arrangement works with an open stokehold, and the air from the forced draught fan is led to the burners by trunk ways. As each burner is enclosed in a separate air-control casing any of them may be put out of commission without affecting the draught control of any of the others.

The burner itself consists of two concentric cylinders with an annular space between them. The oil fuel enters the burner from the side and passes along this annular space and through grooves formed in the front end of the central cylinder which abuts against a cap nut. Through these grooves the oil obtains access to the discharge opening in the cap nut. The size of this opening is controlled by a central spindle which passes through the inner cylinder and is controlled by a hand wheel at the back end of the burner. These hand wheels can be seen in the figure. In addition to this regulation of the outlet the burners may also be adjusted for different outputs by varying the pressure.

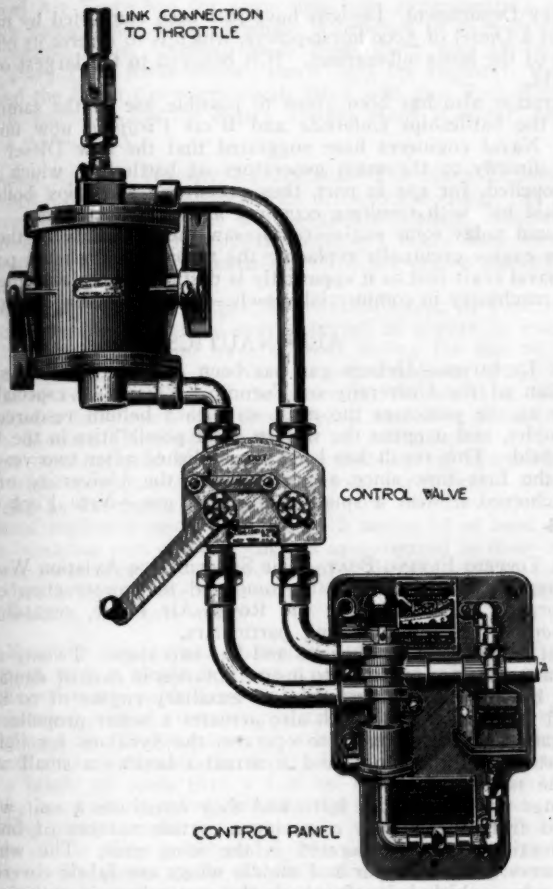
PROTECTION AGAINST RACING OF PROPELLER.—The governor consists of three units: a control panel, a control valve, and an operating cylinder. The control panel, as will be noted in the cut, comprises an anticipating-valve, a relay cylinder and a three-way piston valve. The panel may be mounted on one of the engine columns, bulkhead, or any convenient place, and connection made from pipe "A" to the condenser.

The anticipating-valve consists of a closed box suspended in the direction of the keel, in which there is a rocking valve controlled by a rolling ball. It comes automatically into operation when the lift of the ship's stern brings the propeller dangerously near the surface, causing the throttle valve to close the moment before the propeller leaves the water, and to re-open as the ship returns to her normal trim.

The valve is enclosed in an air-tight case and contains a hard glass tube in which the ball is free to roll. This tube is sealed to prevent any steam from coming in contact with the ball. A double rocking valve mounted on trunnions carries the tube, and adjustment of the valve for any trim is accomplished by setting the knurled thumb nut at the bottom of valve box.

The anticipating valve operates between the condenser and relay cylinder. When opened by the pitching of the vessel, the under side of the piston in the relay cylinder is put into communication with the condenser. Atmospheric pressure, always present on the upper side of the piston through holes in the casting, causes it then to force the piston down against a coiled spring. The relay cylinder piston rod and three-way valve piston are built in one piece, thus synchronizing the movement of both valves.

The three-way valve controls the admission of atmospheric pressure to either side of the double acting piston of the operating cylinder, which is connected directly with the throttle valve or lever. The piston in the



Control Device To Prevent Racing of Propellor

three-way valve is so arranged that when the governor is in the normal position and the main throttle open, the pipe on the right is in communication with the condenser, and the pipe on the left is under atmospheric pressure. When the valve piston is moved down, the pipe on the right admits atmospheric pressure, and the other pipe is put into communication with the condenser, causing the piston in the operating cylinder to move and close the throttle valve. As the ship's stern settles again into the water, the ball rolls back to the after end of the anticipating-valve box and closes it, thereupon opening the main throttle.—*Descriptive Pamphlet.*

NAVY ENGINEERS PLAN 3,000-H. P. DIESEL ENGINE.— DEPARTMENT EXPERTS WORKING TO DEVELOP TYPE FOR SUBMARINE CRAFT.—Washington, April 21.—Development of the Diesel engine, conceded by experts to offer the greatest possibilities for progress in ship propulsion, has been taken up

by the Navy Department. Designs have just been completed by naval constructors of a Diesel of 3,000 horse-power, which is to receive its official tryout in one of the latest submarines. It is believed to the largest of its kind in the world.

Consideration also has been given to possible use of the same type of engine in the battleships *Colorado* and *West Virginia*, now under construction. Naval engineers have suggested that the new Diesel could be connected directly to the main generators of battleships which are electrically propelled, for use in port, thus permitting the ships' boilers to be entirely "laid by" with resulting economy in fuel consumption.

It was said today some engineers foresaw the possibility of the internal combustion engine eventually replacing the turbine as the main power unit of larger naval craft just as it apparently is destined to replace other power-producing machinery in commercial vessels.—*Baltimore Sun*, 22 April, 1923.

AERONAUTICS

HELIUM LIQUIFIED.—Helium gas has been liquified by Professor John C. McClellan of the University of Toronto. This is of especial interest to Canada as she possesses the most important helium resources of the British Empire, and it opens the way to great possibilities in the Canadian industrial field. This result has been accomplished after two years of experiment, the first time since a professor of the University of Leyden partially achieved it with a small quantity of gas.—*New York Times*, 1 April, 1923.

BRITISH TORPEDO FLYING BOAT.—The Supermarine Aviation Works, Ltd., of Southampton, England, recently completed the construction of a new type of torpedo flying boat for the Royal Air Force, regarding which *L'Aéro-Sports* gives the following particulars.

The boat hull is built of plywood and has two steps. Twenty-six water tight compartments are provided to insure flotation in case of damage to the hull. The bilge pump is actuated by an auxiliary engine of 60 hp. which is mounted in the boat and which also actuates a water propeller for surface navigation. This engine also operates the dynamos for lighting the boat and starting the engines, and it actuates besides a small winch for hoisting the 125 lb. anchor.

The wings are of triplane form and they constitute a unit which can be removed from the hull by removing a certain number of bolts. The engine mountings are incorporated in the wing unit. The wings have wooden frames, and the upper and middle wings are fabric covered, while the lower wing, which is 10 ft. above the water line, is entirely covered with plywood.

The following specification is available:

Span, top and middle wings, 16.46. m.
Span, bottom wing, 14.02 m.
Overall length, 9.15 m.
Maximum height, 7.62 m.
Total wing area, 112 sq. m.
Engines, two 600 hp. Rolls-Royce "Condor."
Gross weight, 9525 kg.

The Supermarine torpedo flying boat can carry sufficient fuel for a 1,000 mile flight, or it can carry two 3,000-lb. automobile torpedoes for a flight of less distance. The protective armament comprises five machine guns, disposed as follows: one forward in a gun ring, three amidships on a platform situated on the boat aft of the wings, and one aft, near the biplane tail.

The Royal Air Force has for some time been experimenting with large ocean going flying boats, none of which is believed to have so far passed the experimental stage. Among these boats there may be recalled the Felixtowe *Fury* (five Rolls-Royce "Eagle" 375 hp. engines), the Vickers *Valentia* and the Short *Cromarty* (both fitted with two Rolls-Royce "Condor" 600 hp. engines), and the Fairey *Titania* (four "Condor" engines).—*Aviation*, 9 April, 1923.

ENDURANCE RUN OF WRIGHT E4 ENGINE.—The Navy Department announced April 8 that a Wright model E4 aeronautical engine has just completed a record-breaking test at the Naval Air Station, Anacostia Field. The test comprised a total of approximately 573 hours with throttle wide open, during which time no essential parts of the engine showed any evidence of failure.

This engine, built by the Wright Aeronautical Corp., of Paterson, N. J., and subjected to intensive study over a period of a year by engineers of the Navy Department, would have covered during the test at the usual cruising speed maintained by the Navy at sea, a distance of approximately 60,000 miles or twice and a half times around the world at the equator in a period of a little more than three weeks, according to Rear Admiral William A. Moffett, Chief of the Bureau of Aeronautics.

This test demonstrated the entire practicability of operating aircraft engines at wide open throttle without overhaul for a period at least eight times as long as has been accepted in the past for conventional aircraft engines, naval engineers said. This means a saving of at least ninety per cent in the operating cost of these engines as compared to those of similar design in use heretofore. The improvement is the result of intensive work for more than a year in the engineering section of the Bureau of Aeronautics.—*Aviation*, 16 April, 1923.

FLYING PRACTICE ABOARD THE "LANGLEY."—The flying deck of the *Langley* is of steel, with a single layer of wood on top. While cruising this deck has several masts, with a smokestack protruding above on one side. When planes are launched everything is stripped and the deck is clear from stem to stern, with the exception of a network of wire cables. These run fore and aft and athwart the deck. The fore and aft wires are supported to a height of more than a foot on rows of "fiddlebacks," which are raised by hand and knocked down by the flying machine when it lands.

The landing paraphernalia is very simple. A large hook held close to the fuselage of the plane is dropped by the pilot when ready to land. As the wheels of the plane touch the deck this hook engages one of the athwart wires, whereupon graduated weights below the deck take up the speed of the plane and bring it to a quick stop. Meanwhile, a series of smaller hooks engage the fore and aft wires and prevent the plane turning in the wind.

The flying deck of the *Langley* looks large to persons standing on it, but to pilots approaching for a landing at high speed it seem little wider than a strip of ribbon, and they always wonder whether they will be able to strike it. Every precaution is taken to provide the greatest degree of safety in order to give the pilots maximum protection in landing. The deck of the *Langley* is not large enough for more than one plane to land safely at a time, and this will not be attempted except in a real emergency.

The *Langley* stands high above the water, and from a distance, with a flying deck far above the hull, has the appearance of topheaviness. Tendency in this direction has been offset by placing in the hold many tons of ballast.

Naval fliers are looking forward with keen interest to the commissioning of the two new modern aircraft carriers now being converted from

the hulls of battle cruisers doomed by the Five-Power Naval Treaty. These vessels, which will have twice the speed of the *Langley*, will be closer to the water and have numerous refinements which were not possible in converting the vessel originally designed for service as a collier. The flying decks of the new carriers will be more than 800 feet in length and approximately 105 feet in width, making a much safer landing platform.

The *Langley* is a fairly steady ship, but necessarily rolls and pitches in a heavy sea much more than a vessel of the dimensions of the new carriers. The broader beam and heavier hull construction of the latter will give them a minimum of roll and pitch, increasing the safety factor in taking off from and landing on the flying deck when the seas are heavy.

The stowage hangar on the *Langley* is open and in heavy seas will ship considerable water. On the new carriers the larger number of planes will be housed in a closed hangar.

Planes are taken from the hangar of the *Langley* to and from the flying deck by an elevator large enough to lift or lower two machines at a time. About three minutes are required to pick up a plane in the hanger with a large crane, place it on the elevator, and lift it to the flying deck in readiness to take off.

During the early flights from the *Langley* several planes in landing were thrown forward violently on their noses, smashing their propellers but doing no major damage to the machines. This tendency, due to the sudden stoppage of a plane traveling at a speed of fifty to sixty miles an hour, has been corrected by placing a small wooden frame between the fuselage and the top of the landing wheels. When a plane tips forward on landing on the *Langley's* deck this frame touches the deck and the pull of the weights below causes it to immediately assume an upright position.

Only one minute is required for the crew to jump from the nets alongside the deck, release a plane in the landing wires and move it forward for another flight. Everything on the *Langley* deck moves with clocklike precision.

A moving-picture film is taken of every landing, so that faults and defects may be clearly shown to the pilots. Experience has taught the officers that things happen so quickly with planes landing at high speed that the human eye cannot follow them accurately. These films are shown on the screen in the wardroom at greatly reduced speed, with all the pilots present. With one machine recently developed it is possible to stop the film and hold it indefinitely on one spot, so that every detail of the landing can be studied at leisure and faults and defects corrected on succeeding flights.—*New York Times*, 16 April, 1923.

NAVIGATION AND RADIO

NEW SHIP COMPASS READY FOR TRIALS.—INSTRUMENT SIMILAR TO THAT DEVELOP FOR USE IN AIRCRAFT.—Washington, April 19.—A development of the new "earth induction compass" similar to that designed for airships, but intended for vessels at sea has been practically completed by Dr. L. J. Briggs and Dr. Paul R. Heyl of the United States Bureau of Standards and is ready for a sea trial on some Navy vessel. It is larger than the one used in planes, actuated by an alternating current motor instead of wind cups, and is more heavily built; but the principle is the same.

Two direct currents are generated by revolving two pairs of brushes at a velocity of about 1,400 revolutions per minute in the magnetic field of the earth. The instrument is so adjusted that when set for a compass bearing the currents flowing from each pair of brushes are equal and produce no effect on a galvanometer. If the instrument turns even slightly, one current becomes stronger and the dial needle is deflected.

The advantage of the instrument for war vessels in that while the generator may be put in a fighting top, the greatest possible distance from any effect of the magnetism of the metal of the ship, the control dial may be on the navigating bridge. In contrast to the gyroscopic compass, now in use on many vessels of the navy, the new compass is inexpensive and within the reach even of the small merchant craft.—*Baltimore Evening Sun*, 18 April, 1923.

CONTOUR MAP OF OCEAN BED.—The Bathymetic Chart of the west coast of the United States, from San Francisco to Point Descanso, Mexico, Hydrographic Office Chart No. 5194, just published by the Hydrographic Office of the Navy Department, is the result of a survey using the Sonic depth finder conducted by the U. S. S. *Hull* and *Corry* at the request of the Carnegie Institution of Washington.

The observations obtained by the survey of the U. S. S. *Hull* and *Corry* have permitted the construction of a contour map of the ocean floor by the Hydrographic Office from the coast line to a depth of 2,000 fathoms. This is the first successful contour map of a zone of deep sea soundings ever made. The chart represents the configuration of the ocean floor in the region, showing the submerged hills, valleys, cliffs and precipices. The recent earthquake in Chile suggests that the undersea portions of coastal faults may be most active and dangerous.

It is perfectly clear from the contour map that a number of very steep slopes or cliffs have been located, some of which may be fault scarfs of considerable elevation. The indications are that the chart also locates the so-called continental shelf which is commonly thought of as representing the structural demarcation between a sinking ocean bed and a rising continent.

Regions in which changes occur frequently, such as the coast of Chile or the Hawaiian Island group, can be studied with great care and detail, and the direction in which future displacement may be expected can be ascertained.

The clearness with which these contours are delineated by the Sonic survey completed suggests the possibility of a more effective study of continent building and of the general problem of isostasy than has heretofore been possible. Ancient connections, such as are supposed to have existed between South America and Africa or across the Indian Ocean, can now be worked out almost as positively as upon a land area.—*Army and Navy Journal*, 7 April, 1923.

U. S. S. "DENVER" TO MAKE IMPORTANT SOUNDINGS.—The U. S. S. *Denver*, attached to the Special Service Squadron in Central American waters, after completing her docking, overhaul, and the installation of a Sonic depth finder, sailed for its regular station in the Gulf, April 10, and en route will investigate for the Hydrographic Office of the Navy Department, by means of the Sonic depth finder, a reported 21-fathom bank reported E.N.E. of Cape Hatteras in approximate latitude 35 degrees 33 minutes North, longitude 74 degrees 10 minutes West.

There are many shoals and banks carried on the navigational charts published by Hydrographic offices, some of which are near the steamer routes. The position or existence of many of these shoals is not accurately known. There are also areas of considerable extent in the oceans which have never been explored.

The *Denver* during her stay in Southern waters will investigate for the U. S. Hydrographic Office, by means of a Sonic depth finder, some of these doubtful, dangerous and unexplored ocean areas which are to the eastward of Central America and north of South America.

Among the banks and shoals to be investigated are: Sacramento Shoal, Gulf of Campeche, lat. 20 degrees 50 minutes N., long. 93 degrees W.; Misteriosa Bank, lat. 18 degrees 50 minutes N., long. 83 degrees 50 minutes W.; and Serranilla Bank, lat. 15 degrees 50 minutes N., long. 79 degrees 30 minutes W. in the Caribbean Sea.

There are two unexplored sea areas to the northward of Colombia and Venezuela of approximately 57,000 and 45,000 square miles, respectively, and one to the eastward of Costa Rica of about 15,000 square miles, in which there are no records of any soundings of the charts. The *Denver* will run lines of soundings across these areas. This reconnaissance of these areas with the Sonic depth finder will develop some of the contours thus enabling the Hydrographic Office to form an opinion as to the need for more extensive surveys to locate possible shoals or banks in these unexplored sea areas.—*Army and Navy Journal*, 14 April, 1923.

ORDNANCE

U. S. S. "IOWA" SUNK BY GUNFIRE.—The experimental firing against the old battleship *Iowa* while under way under radio control in Panama Bay March 22, incident to the maneuvers of the U. S. Fleet, was a great success and demonstrated superior marksmanship. The old *Iowa* had a length of 360 feet, with armor on her water line eighteen inches, fifteen inches on turrets and a protective deck of three inches.

The battleship *Mississippi*, running at 19 knots, first opened the attack from a range of some six miles with her five-inch guns. One hundred and sixty-two rounds were fired with thin-walled shells, and twenty hits, it is unofficially reported, were made, mostly on the hull. The forward funnel was shot away, her radio control apparatus was destroyed and she was sufficiently hulled to take in large quantities of water, which soon caused her to list.

The second phase of the firing took place at about nine miles with the 14-inch guns, using armor-piercing projectiles with full charges. Nine salvos were fired from five of the guns and six hits were scored, two of them being near the water line, and making large holes in the hull. The *Iowa* finally turned turtle and sank in sixteen minutes from the time the second attack began. She went down about fifty-five miles off Balboa in seventy-five fathoms of water. Besides the holes in her hull, most of her upper works were shot away, including the bridge and both funnels.—*Army and Navy Journal*, 31 March, 1923.

LIQUID OXYGEN USED AS HIGH EXPLOSIVE.—The latest thing in blasting explosives, cartridges of lampblack soaked in liquid oxygen, got a trial at a quarry near here recently. The tests were conducted by a representative of a German firm of manufacturers of liquid oxygen apparatus under an arrangement with the United States Bureau of Mines. The test was said to have been successful.

The liquid oxygen explosive has a number of advantages over the older sorts. It can be made on the spot and the cartridge is perfectly safe until after the liquid oxygen has been poured into the hole into which it has been placed. The hole is then tamped and the cartridge exploded. No poisonous gases are set free by the explosion. If the cartridge fails to explode it is not a continuing source of danger, but after about twenty minutes the oxygen evaporates from it and it again becomes harmless.

The Germans are said to have made much use of liquid oxygen for blasting purposes during the war. It was unsuitable for a military explosive and was used, therefore, wherever possible in place of the expensive nitrogen-containing explosives, which were essential at the front.—*Baltimore Evening Sun*, 26 March, 1923.

NEW ARMY GAS MASK LETS WEARER SPEAK.—The Chemical Warfare Service of the army has developed a new gas mask so constructed as to enable the wearer to carry on conversation while using it and thus making it possible for officers to give orders in battle without removing it.

The new mask has a sort of diaphragm attachment somewhat similar in appearance to that used on phonographs. By means of it the wearer of the mask can carry on conversation with about eighty per cent of the efficiency of the average speaking voice.

The new mask has a sort of diaphragm attachment somewhat similar contains a new canister which, through the addition of new chemicals, not only protects the wearer against the ordinary gases used in chemical warfare but also against ammonia fumes and the deadly carbon monoxide.

There are also features embraced in the construction of the new, "all-purpose" canister that lessen air resistance and reduce the distress of breathing to practically a negligible quantity. This improvement includes elimination of the nose and mouth pieces and has resulted in considerable reduction in the amount of charcoal used in the mask. The new mask likewise contains a device for passing dry air from the chemicals over the eyeglasses of the mask. This prevents collection of moisture and considerably improves the vision. A special arrangement also enables the chemical containing case to be carried under the arm instead of on the chest, as in other types of masks, and thus provides greater freedom in body movement of the wearer.—*New York Times*, 15 April, 1923.

TWO BATTLESHIPS FOR ARMY AIR TARGETS?—By September 1 it is expected that arrangements will be made for turning over the battleships *New Jersey* and *Virginia* to the Army for use as targets for bombing tests by the Army Air Service.

It is understood that a comprehensive plan being prepared in the Air Service for conducting the bombing test with the condemned battleships will contain some entirely new features.—*Army and Navy Journal*, 14 April, 1923.

MISCELLANEOUS

AMERICA NOT TO BLAME IF ARMS TREATY FAILS.—London, March 8.—There seems to be a tendency in certain quarters in the United States to resent foreign criticism of the results of the Washington Conference as an aspersion upon the good faith and ability of American statesmen.

Why this should be so it is not at all clear, seeing that by far the most outspoken criticisms which have been published are those uttered by Americans themselves, especially naval officers. Many of the latter appear, indeed, to regard the fleet limitation pact in the light of a national disaster.

No responsible writer on this side of the Atlantic has ever questioned the benevolent motives which inspired President Harding to make his appeal for world disarmament. If considerations of domestic policy were present at all, they were obviously subordinate to the higher aim of stabilizing peace by removing one of the most fruitful causes of war—namely, competitive armaments.

Nor were the American proposals confined to the scrapping of fighting ships. They went to the root of the problem by seeking to eliminate political and economic friction in the Far East, which was rightly perceived to be the potential storm center. In pursuance of this aim the five-power treaty of naval limitation was supplemented by two covenants in which no less than nine powers were concerned, the one relating to principles and policies to be followed in questions concerning China and the other relating to the Chinese customs tariff.

In fact, American statesmen did everything that possibly could be done to buttress peace in a quarter of the globe where trouble seemed to be brewing, and their efforts were undoubtedly successful to the extent of a conflict which many sober judges had previously believed to be not only inevitable but imminent has in all likelihood been deferred for years to come.

As regards naval limitation, it is certainly not the fault of the United States that this object has been only partially achieved. The scheme which Mr. Hughes put before the conference at its first sitting embraced every type of fighting vessel, cruisers and submarines being rationed no less rigidly than battleships; and, according to my information, the American delegates in the ensuing discussions were solidly against exempting any type from the scheme of tonnage limitation. It was only when agreement on this point was seen to be unattainable, and further resistance threatened to jeopardize even the restriction of dreadnaughts, that Mr. Hughes and his colleagues gave way.

France has hitherto received all the blame for wrecking the original plan of disarmament by her insistence on a much larger ratio of submarine tonnage than was assigned to her. But it should not be forgotten that Admiral Baron Kato had previously expressed the unwillingness of Japan to accept any restriction on the number of so-called "defensive ships," a term which he clearly intended should apply to submarines, if not to cruisers as well.

It does not follow, therefore, that Japan would have agreed to the quota of auxiliary combatant tonnage allotted to her under the original plan, even if France had not come to the rescue so conveniently. But the point is that the United States, through her delegates, tried her utmost to secure the adoption of a comprehensive scheme which would have rendered future naval competition, in any shape or form, absolutely impossible. The fact that she did not succeed casts no reflection either on her sincerity or the skill of her statesmen.

Mangled and incomplete as the naval treaty in its form may have been, the majority of those present at the conference fondly hoped that it would still prove effectual as a curb on future rivalry in sea armaments. The only apprehension felt was lest France should begin forthwith to expand her submarine fleet. Apparently no one dreamed that Japan, who had co-operated so heartily in framing the pact, would be first to break away from the principle which it embodied, in spirit if not in letter. Such, however, was the case. Scarcely was her signature dry on the treaty when she began ordering so many cruisers and submarines that their tonnage exceeded the collective total of similar ships building or projected by all the other Powers.

Various explanations have been advanced by Japan for a procedure so difficult to reconcile with her attitude at the conference. It was necessary, we are told, to save the national shipbuilding industry from the ruin with which it was faced as the joint result of the mercantile shipping slump and the cancelling of battleship contracts, and the only means of doing this was to keep the yards going with minor naval orders. The reply to this argument is that foreign shipbuilding firms, which suffered quite as severely as those of Japan, have had to keep going without Government help, and have contrived to carry on by opening up new branches of manufacture.

In any case the placing of large orders for naval tonnage seems a curious method of meeting unemployment. If every other country adopted this remedy we should see naval competition revived with a vengeance. Great Britain, for example, with ten times as many shipyards as Japan and a million and a half men out of work, might with equal reason claim the right to build a veritable armada.

It looks as if the Japanese themselves realize the flimsiness of this pretext, for they now insist that the weakness of their battleship fleet, as cut down by the treaty, compels them to make good the deficiency by multiplying their lighter naval forces.

Quite apart from its disregard of the moral obligations imposed by the treaty, this excuse is even less convincing than the economic argument. So far from having forfeited any degree of naval power in consequence of the limitation agreement, Japan has gained enormous advantages in this respect, her strategic position today being at least twice as strong as it was before. Then, again, the new vessels which she claims to be building for the defense of her coasts are, in fact, the very types least suited for this function. Governments do not build fast cruisers of 10,000 tons and large submarines of ocean-going radius for purposes of coast defense. Consequently, with the best will in the world, it is difficult to square the facts of Japanese post-treaty naval policy with the official reasons given in justification thereof.

I understand that some comment has been provoked by an article of mine published recently in an American review, in which, dealing with Japan's hurried and secret fortification of the Bonin Islands for months previous to the conference, I said: "Whether the American naval experts were cognizant of the facts is a moot point, but it seems scarcely credible that they would have acquiesced in the status quo proposal for Pacific bases had they known that Japan was already in possession of a thoroughly equipped naval station at the Bonins. If they did know this, one is forced to conclude that their protests against the renunciation of the right to put the western islands in an adequate state of defense was overruled by the Washington Cabinet on political grounds."

To interpret these remarks as a slur on President Harding and his Cabinet is to misread them entirely. In the first place, it is by no means certain that the American naval authorities had received intelligence as to the elaborate nature of the forts that were being erected at the Bonins; in fact, the Japanese took extraordinary pains to conceal what they were doing there. Secondly, if this information had reached Washington before the conference met, there could be no more striking proof of the American Cabinet's resolve to promote disarmament than its decision to accept the situation.

Had it insisted on retaining the right to fortify the Philippines as a counterpoise to Japan's newly created stronghold in the Bonins, the whole plan for naval limitation would have collapsed at the outset, for Japan had made it clear that agreement on the status quo for Pacific bases must precede negotiations for the reduction of her dreadnaught program and that failing such agreement she would decline to accept any limit on her future battleship tonnage. Thus, if the "political grounds" mentioned in my article operated at all, they were of a higher nature than those of mere expediency.

Whether the sacrifice of defensive power which the status quo agreement imposed on the United States was well advised from the cold, matter-of-fact viewpoint of the strategist is a question to which no answer need be attempted here. But if doubts have lately arisen on the subject they are due entirely to the action of Japan in building so many additional war craft.

It was said at the time, and with truth, that the United States, by abandoning the proposed bases at Cavite and Guam, had given Japan an absolute guarantee of immunity from attack. Nowhere was the value of the gift more clearly apperciated than in Japan itself. And yet, immediately afterward, we find that country resuming the building of warships with an almost feverish energy, as if she were expecting an early attack, in-

stead of being, as she is, compassed by impregnable defenses, of which the broad Pacific is not the least.

In view of this unexpected development it is not surprising that doubts as to the lasting value of the Washington treaties should be invading the minds even of those to whom the conference has hitherto stood as the greatest peace achievement in history. Japan may be perfectly sincere in her belief that the new fleet she is building up is essential to her safety, in which case we can only conclude that she forsees dangers invisible to the rest of the world. On the other hand, this rapid expansion of naval force may be due to the influence of the militarists, who have never concealed their opinion that powerful armaments are required to discourage foreign interference with their plans for dominating the Orient. But whatever her true motive may be, Japan has already done much to vindicate the skeptics who declined to believe that the balance of power could be permanently maintained by international agreement.—Hector C. Bywater in *Baltimore Sun*, 25 March, 1923.

FRANCE AND THE WASHINGTON TREATY.—Paris, March 24.—It seems now to be assured that Premier Poincaré must put some sugar coating on the Washington naval treaty to get the Chamber to swallow it, for the Nationalists, who control Parliament, have regarded the compact as a bitter pill from the day Secretary Hughes proposed the ratio for French capital ships.

Unlike the American Senate, the French Parliament cannot tack reservations onto a treaty. It must take it or leave it as presented by the Premier. However, the Premier can suggest either reservations or changes which Parliament may adopt. In the present case it is planned to have M. Poincaré make certain declarations to be incorporated in the law authorizing the President of the republic to ratify the treaty. It is said that the French Deputies want reservations *a la Americaine*.

Frankly, the majority of the Deputies do not want the treaty, and if they ratify it it will be because the Premier backs its ratification as necessary for French foreign policy. Were the treaty before the Chamber strictly on its merits it would certainly be defeated.

The question now is: What are the reservations the Deputies will ask before they will ratify the treaty? The Chamber's Foreign Relations Committee, which relatively has more power than the American Senate Foreign Relations Committee, has asked M. Poincaré to add to the Treaty a Government reservation stating that France does not regard the 5-5-3-1.75 ratio as a permanent measure of her strength in capital ships, and a complementary reservation stating that France ratifies the treaty as valid only up to December 31, 1936. It will be recalled that the treaty provides for its remaining in force if within two years prior to the end of 1936 no nation has denounced it.

The argument back of the first proposal is that the ratio is unfair to France, who, although not now able to build up a big fleet of capital ships, might be able to do so some day. The second proposal is political in nature, and seeks to avoid placing upon the French Government in 1934 the possible task of denouncing the treaty, which at that time might still be regarded highly by the other parties to it.

On the other hand, the committee has dropped its proposal to raise the French ratio to 2.50, on the advice of M. Poincaré that such a step was impracticable, making necessary too extensive negotiations.

One hears it said repeatedly that America can have no valid objection to the French reservations since the Washington Senate has set the style, it being recalled specifically that the Senate even tied reservations to its ratification of the Pacific four-power pact.

On top of the reservations demanded by the Foreign Relations Committee, the semi-official *Temps* comes out tonight with a request for another modification of a more serious nature—in brief, that if Germany doesn't observe the naval disarmament clauses of the Versailles Treaty, France may not be bound by the naval treaty. This, of course, enters on a path which may lead almost anywhere, because England accepted her ratio only on the understanding that France's tonnage in capital ships would be set.

The *Temps* reasoning is ingenious, as Herbette always is. He begins by pointing to the American reservation to the four-power pact, to the effect that the United States is not bound to use force to carry out its obligations, and says that sets a precedent for France, which needs to make reservations on another treaty issue of the same conference. Recalling the difference between the prerogatives of the French Parliament and the American Senate, the *Temps* says the proper method for M. Poincaré will be to propose reservations to be inserted in the law permitting ratification. Herbette adds: "We hope the American Government will appreciate the effort made here to give definite character to the somewhat bitter Washington naval treaty."

The *Temps* then justifies the proposal to ratify the treaty specifically only until the end of 1936, saying that inasmuch as France doesn't intend to accept its provisions permanently, such a step will remove the danger of hard feeling later. Herbette then puts forth his proposal:

"When she signed the naval treaty at Washington France had previously signed the Treaty of Versailles. At Versailles Germany's naval armaments were limited, and she was forbidden to build warships for other nations or send naval missions abroad, and so on. As long as these clauses are obeyed France remains in the position she was in when the Washington treaty was signed. But if the Treaty of Versailles is violated all would be changed. New naval precautions would be necessary, and perhaps so urgent that there wouldn't be time to convoke the conference provided for in Article 21. Shouldn't this eventually be covered?"

The *Temps* then proposes a law ratifying the treaty, saying it is approved "with the understanding that ratification and execution of the treaty cannot have the effect of delaying urgent measures which the French Government may be obliged to take if certain provisions of the Treaty of Versailles appear to be no longer respected." The proposed law would set forth the provisions of the Versailles treaty referred to.

The *Temps* concludes: "After these reflections upon the naval treaty of Washington there remains another international pact signed at Washington, the treaty on the relative use of submarines. We shall speak of that later."

The *Journal des Debats* says tonight that France must ratify the Washington treaty, even though she does not like it. "Regrettable as was the manner in which the Washington negotiations were conducted, and contestable as may be the provisions adopted, the Government of France and the French Parliament cannot afford not to approve the treaty. Otherwise they would provoke in other countries signing the treaty, notably the United States, a very marked irritation which might gravely compromise our international position. More than ever there would be cries of 'French imperialism.' Harding and Hughes would never forgive us for imperiling the great accomplishment upon which they place so many hopes of various kinds."

The *Journal des Debats* approves the proposed declaration that France does not accept the ratio as permanent, and says this declaration must be made to other signatories. America, it argues, did the same thing with respect to the Four-Power Treaty. The newspaper adds that France will accept the ratio until 1936, but reserves her liberty after that date.

Pertinax, in the *Echo de Paris*, reviews what he regards as an injustice the treaty does France, saying: "Without consulting us, the representatives of England, America, and Japan, sitting behind closed doors, decided we could not have any more capital ships than a ratio of 1.75."

Pertinax approves the Foreign Relations Committee reservation, and adds that France must also make reservations on the compact limiting the use of submarines.

The *Matin* says: "One hundred and seventy-five German submarines held in check the greatest naval coalition in history. How much would 175 submarines cost us? The same price as six battleships."—Edwin L. James in *New York Times*, 25 March, 1923.

"MODERNIZATION" OF U. S. BATTLESHIPS.—Washington, April 15.—Work of elevating the guns of the battleships will start, as originally scheduled, on the return of the fleet from the Southern drill grounds next week if President Harding takes the advice of the naval authorities.

The unanimous opinion of the department as voiced by responsible officers of all ranks, after an exhaustive investigation by responsible heads of the issue raised by the publication of Secretary Hughes' "apology" for the misstatement regarding the British changes holds that nothing that has happened changes the status of the navy's recommendations.

With practically no dissenting opinion the department takes the ground that nothing in the spirit or letter of the treaty forbids elevating the guns, and that it is imperative that this be done if the treaty status of equality between the United States and Great Britain is to be established.

While refusing to comment on what is to happen pending final decision by the President, Assistant Secretary Roosevelt, who has been handling affairs in Secretary Denby's absence, is on record in the recent Congressional hearings as being unqualifiedly for the change in elevation. He believes the situation now is unchanged except that the disparity in range is less than was believed when the hearings were held. Instead of being outranged nearly five miles, as Congress was then advised, the difference, according to the figures based on the recent British statement, is about two miles for the main fleet.

Following a preliminary conference last week with the President, at which the details of the controversy were laid before him, Mr. Roosevelt had had all of the data bearing on it prepared ready for the Chief Executive in the near future when he is ready to take the question up for final settlement.

In order to summarize as clearly as possible the navy's attitude so as to give the public a better understanding of the entire matter, the following interview was obtained from Rear-Admiral W. L. Rodgers, head of the general board of the navy:

"American naval officers who were most closely in touch with the work of the Washington Conference of 1921-22 are at one in their belief that nothing in the naval treaty, either in spirit or letter, prevents increasing the elevation of the guns of United States battleships now in existence as provided by the Congressional appropriation of last session.

"The United States Navy is to be second to none. It can only hold this place under the treaty by modernizing its ships. Other nations are doing the same thing, but not all take the same steps to reach the objective.

"Modernization of ships is as old as navies. The United States Navy, like the British Navy and the French Navy, has always followed the practice.

"The limitations on modernization prescribed by treaty are to prevent abuse of the treaty by building practically new ships under cover of alterations.

"Such sharp practice it was the intention of the treaty to forbid, but each nation is free to modernize its own ships as it thinks best without disputing the methods preferred by any other navy, always keeping inside the treaty limitations. Great Britain has denied she has employed the method of modernization by increasing the angle of elevation of guns as the American Navy Department previously had reason to believe.

"This British denial the American Navy, through its Assistant Secretary, has accepted as conclusive, but such acceptance by no means affects United States rights to do as it pleases with its own guns without reference to Great Britain to learn in what form the latter is exercising her corresponding right. The change in angle of elevation is what the United States Navy needs to keep our ships equal to those of Great Britain, which may choose at pleasure means of modernization more suited to its needs.

Neither the treaty nor the spirit of the treaty attempts to preclude competition. A navy equal to Great Britain entails competition as its basis. The treaty limits competition to such as may take place within the terms of the treaty, and to this extent only.

"If the country wants no navy, or wants a navy that is inadequate and ineffective in support of national foreign policies, it may readily have such. But it should go about it knowing what it is getting and not thinking it is getting a navy second to none.

"Putting the matter in another form, it is unbelievable that our delegates in signing meant to agree that Great Britain by treaty was to preserve for some of her ships an ability, to fire at ranges which most of our ships cannot attain without alterations very moderate in extent. Our delegates surely meant to have a navy 'second to none.'"

Supporting this opinion of Admiral Rodgers, who incidentally is the senior admiral of the navy on the active list, the following is an abstract of a "connected review of the whole matter" that has been prepared by one of the ranking officers in the department:

"There have been many references in the press to the question of increasing the gun elevation of turret guns of United States battleships. There seems still to be wanting, however, a connected review of the whole matter. Much will hinge upon a correct decision.

"When the treaty for limitation of armament was drawn its stated object was 'to contribute to the maintenance of the general peace and to reduce the burdens of competition in armament.' The specific measures to accomplish these objects centered around the adoption of the 5-5-3 ratio of naval strengths. When this ratio was applied to capital ships the ships and their present listed tonnages were given specifically. It was evident that if there was no restrictions placed on rebuilding or remodeling capital ships a few years might find ships of the same name still in service, but of greatly altered characteristics. Those things that could not be changed were enumerated in Part 3, Section 1 (d) of the treaty as follows:

"(d) No retained capital ships or aircraft carriers shall be reconstructed except for the purpose of providing means of defense against air and submarine attack, and subject to the following rules: The contracting powers may, for that purpose, equip existing tonnage with bulge or blister or anti-air attack deck protection, providing the increase of displacement thus effected does not exceed 3,000 tons (3,048 metric tons) displacement for each ship.

"The effect of this enumeration of forbidden changes is, as is well known to all, to permit all other changes that do not in effect amount to the reconstruction of the vessel. We have, therefore, to examine the meaning of the phrase 'no alterations . . . in general type of mounting of main armament.' This is the English version of the treaty. What does 'general type of mounting mean? We can get a great deal of assistance in determining

the meaning by going to the French version of the treaty, which has equal effect with the English version. The French version literally translated reads 'all change will be forbidden in . . . the number of guns of the principal armament as well as all changes in its general plan of installation.' . . .

"Reading these provisions of the treaty together, it will be seen that there is no prohibition against any change of the guns except (1) number and (2) general plan of installation.

"We have now to examine what the nature of the change is that will have to be made in our battleships if they are to be made equal to British battleships. The object to be attained is to make it possible for our guns to shoot farther. It must, therefore, be possible to point them higher in the air at a greater elevation. When the guns are pointed now as high as possible they touch the upper part of the turret opening through which they project. This opening is out through very heavy armor. If the guns must point still higher the turret armor will have to be cut away from the upper side of the gun port. That is step number one.

"As the muzzle of the gun goes up the breech will be descended lower in the turret and may come against the structure inside of the turret. Therefore, the second step will be to provide a clear space into which the breech of the gun may be depressed for the greater elevation of the muzzle. The third step in the change may require that the gun be pivoted on trunnions that are a little closer to the front armor plate of the turret. If this is done the breech of the gun will be a little more out of balance and will require more power to raise and lower it so that the change may involve a more powerful electric motor for elevating and depressing the gun.

"The above are all the primary changes involved in the proposed alterations to the turrets of our battleships. It will be seen that they do not change the number of guns, the caliber of the guns, their general arrangement or their 'general type of mounting' or the 'general plan of their installation,' but simply alter existing mounts and existing turret armor so that the guns may point higher in the air.

"In order that the full meaning may be clearly understood by the public it is well to remember that the British squadron at Coronel was sunk by the fire of the guns that outranged them; that the German squadron at Falkland Islands was sunk by the fire of the guns that outranged their guns, and that the forts of Liége and Namur, in Belgium, were destroyed by guns that could fire on them while their guns, being of shorter range, could not return their fire effectively. In other words, the proposal to prevent the American Navy from increasing the elevation of its turret guns is a proposal to place our capital ship fleet in a position that exactly parallels the position of the defeated squadrons at Coronel and Falkland Islands.

"Specifically there would be in the case of action by the two fleets, which happily seems improbable, a space of over two miles in extent which the British fleet would be able to fire on our fleet with an overwhelming superiority of guns in action. In addition the superior speed of the British fleet would probably enable it to prevent the American fleet from closing to a range where the odds would be less unfavorable to us. It seems as if the spirit of the treaty, being one of equality as between Great Britain and the United States, was of itself sufficient answer to the whole question. Fortunately, however, the specific terms of the treaty leave no doubt as to the correct interpretation of it."—*Baltimore Sun*, 16 April, 1923.

"MODERNIZATION" OF FRENCH BATTLESHIPS.—Paris, April 6.—Preliminary tests made with the modernized French battleships indicate, it is officially stated, that the sight alterations have improved the firing distance of their sixteen-inch guns from thirty to forty per cent.

While French naval circles exercise the utmost secrecy as to the exact improvement in the range of the guns, there is a suggestion that the French battleships now outdistance those of the other navies of the world, unless the same process has been carried out by other nations in the matter of sight elevation.

The French expect to establish the new ranges definitely during the firing tests to be held in the Mediterranean in connection with the general naval maneuvers which begin next Wednesday.

Those observing the tests thus far say the problem involved is about the same as in the case of the big German surprise guns that fired on Paris in 1917; it is possible to increase the range of guns, but always at the expense of accuracy and the size of the projectile used.

The sixteen-inch naval gun is something new in French armaments. It does not appear in naval reference books nor has it been mentioned in previous news dispatches. The largest guns credited to the French in the naval lists are the thirteen-inch caliber. Indeed, it was precisely because France was behind other signatories in gun-power that she was authorized by the Washington Treaty to "increase the caliber of the guns of her battleships, provided the caliber does not exceed sixteen inches."

The French Government, however, recently announced that it did not intend to increase the caliber of its guns, but would raise their angle of elevation, thereby increasing their range. While this elevation is not specifically allowed by the Washington Treaty, France had indicated that she considered it amounted to the same thing as increasing the caliber.—*Philadelphia Public Ledger*, 7 April, 1923.

"MODERNIZATION" OF JAPANESE BATTLESHIPS.—Tokio, April 1.—(By Wireless.)—Vice Admiral Ide, Naval Vice Minister, stated today the Naval General staff is now studying the question of gun ranges raised by the United States "modernization" plans for lifting the elevation of the principal guns. Admiral Ide said he could not indicate the result of the general staff deliberation since no official report had been received from Washington, nor any official hint of a desire on the part of the United States to discuss the question.

However, he did say, the matter does not concern Japan directly since Japan's "modernization" plans do not contemplate changes in gun ranges. All changes will be in the direction of increased protection against aerial and submarine attacks, including heavier deckplates and blistered bulges.

The admiral further declared that the Japanese Navy had not changed the gun ranges of the ten capital ships retained under the Washington arms treaty since they were commissioned, but continued that gun ranges were a matter of the highest secrecy in all navies and were unlikely to become the subject of free discussion.

From another well-informed source it is learned that Japan, prior to the present controversy, had not questioned its right to increase naval gun elevations. I understood from good source that Japan has been engaged in the work on its principal ships for the last three or four years and that such work actually progressed on one or two big warships during the Washington Conference. However, the work is still uncompleted for all ten of the retained capital ships.

At the time of the conference, Japanese naval authorities took it for granted that such changes were permissible.

It is pointed out here that increasing gun elevation is not the only way of increasing the range, hence it would be foolish to insist that this method only be ruled out.

Japan's "modernization" program calls for the expenditure of 50,000,000 yen ($25,000,000) over a period of eight years, beginning with a 2,500,000 yen expenditure in the present year and increasing to 9,000,000 in 1930.

The Tokio press takes up the gun-range issue, interpreting it as a sign of American impatience with the limitations imposed by the Naval Treaty. The *Nichi Nichi* accuses the United States of "raising issues prejudicial to the effects of the Naval Treaty," declaring the contemplated American changes to be a violation of the spirit of the Washington agreement. The *Hochi* says the controversy leads to grave doubts as to whether Great Britain and America desire to maintain the terms of the treaty.—*Philadelphia Public Ledger*, 2 April, 1923.

CABINET TO REVIEW NAVAL SITUATION.—Washington, April 19.—The forthcoming Cabinet conference to decide whether the main batteries of thirteen American battleships shall be elevated to obtain an increased battle range may develop into a major naval council to discuss basic national policies of extreme importance.

Carefully compiled data, illustrating an international race for supremacy in naval auxiliaries which has followed the Washington arms conference, it was said today in naval circles, will be laid before President Harding with formal expression from his naval advisers as to the necessity of the American program if the agreed balance is to be maintained. With this data will be a summary of the joint report of the army and navy on the results of the recent fleet maneuvers off Panama.

The controversy over the gun elevation, raised by the denial of the British Embassy that similar action had been taken in the British Navy and the inference that it was considered as a violation of the five-power naval treaty, is expected to be subordinated to a wider program entailing a review of the full naval situation which has ensued under, if not from, the Washington convention.

On a mathematical application of the five-five-three ratio, President Harding will be informed that the United States is deficient 220,000 cruiser tons and upward of 80,000 submarine tons of the strength of her cosignatories and that these discrepancies are growing steadily.

In modern cruisers, according to the naval computation, the United States holds the small end of a one-four-two ratio, as compared with Great Britain and Japan, even should the ten cruisers of the *Omaha* class be considered as completed and in service. The 7,500 ton *Omahas* are rated as superior to the British ship of the same class, but the ten American vessels are faced by a British fleet of forty-seven and by a prospective Japanese fleet of twenty-one, the bulk of which are of 10,000 tons with armor and armament which make them to all purposes ships of the line.

The remainder of the Japanese program, embracing fifteen cruisers, twenty-four extra-sized destroyers and twenty-two sea-going submarines will be analyzed carefully in the navy's report to the President. Although every element of the foreign naval program is seen, as in the direction of increased size and efficiency, with resulting distortion of the agreed naval ratio, American naval experts do not charge that they in any way violate the letter or spirit of the treaty. It is axiomatic, President Harding will be told, that future naval supremacy will be determined by superiority in classes unrestricted by international agreement.

Expert designers and constructors of the Navy Department have been called into conference by the General Board to consider auxiliary types which should be recommended to meet the situation if the limitation of navies remains confined to capital ships.

The immediate problem set before these artisans was the design of a new submarine of around 2,000 tons. The *S* class forming the bulk of the underseas strength of the American Navy has never been satisfactory either for mechanical efficiency or for space within the hull.—*Baltimore Sun*, 20 April, 1923.

AIRSHIPS OF LIMITED USE IN TIME OF WAR.—London, March 29.—In *The Sun* of March 7 there appeared an interesting dispatch, quoting from the statement broadcast by Rear Admiral W. A. Moffett, chief of the United States Navy's Bureau of Aeronautics with reference to the voyages to be undertaken by the big dirigible *ZR-1*, now building at Lakehurst, N. J. According to this message, it is the intention of the naval authorities to send the airship on a flight round the world, and subsequently to the North and South Poles.

If this program be seriously contemplated, the designers of *ZR-1* must have unbounded faith in their work, for certainly there is no other airship in existence which would be capable of making such formidable journeys. If the *ZR-1* succeeds in cruising round the world without mishap it will give a tremendous boost to airship development in general, but an eminent designer here with whom I discussed the proposition was inclined to be skeptical.

"Either the Americans," he said, "have evolved a type of lighter-than-air craft which is far in advance of any produced in Europe, or they overestimate its powers, for a voyage round the globe would necessitate a degree of reliability and weather endurance considerably above the highest standard so far reached, even in Germany. As for the projected flight to the Antarctic, that would mean facing weather conditions which explorers declare to be the very worst in the world, and which in my opinion no airship yet built could live through. I therefore think the American enthusiasts are looking too far ahead, but it is all to the good that they should be paying so much attention to the development of this type, which is clearly indicated as one of the best and swiftest means of overseas transport."

In my own case I have personal reasons for being interested in airship development, for I witnessed the first successful long-distance Zeppelin flights in Germany fifteen years ago, and at a later date frequently watched the original army and navy Zeppelins maneuvering over the big Johannisfield aerodrome near Berlin. Moreover, during the war I saw Zeppelins in action on several occasions, and the first bomb dropped by a Zeppelin over the city of London, in September, 1915, detonated less than 200 yards from the office where I was sitting. Quite recently, also, I have read the German official account of their Zeppelin fleet and its war achievements.

It is evident from Admiral Moffett's statement that the *ZR-1* is built on the Zeppelin model, since he refers to her as being similar in type to the airship now constructing in Germany for the United States Government. And here let me say that no sounder model could have been chosen, for the Germans unquestionably lead the world in airship design, no other nation having had a fraction of their experience in this work. So America has gone to the right quarter for the nucleus of her airship fleet.

But when Admiral Moffett proceeds to expatiate on the unique value of the Zeppelin for war purposes he enters debatable territory, and since the vessels are apparently to be built in large numbers for the United States Navy, it may not be amiss to discuss briefly their shortcomings from the military viewpoint.

It is quite true that "for long-distance sustained flights, when carrying large loads, the rigid airship is in a class by itself." It is equally true, in theory, that the Zeppelin can "hover over a given spot, making for great accuracy in the dropping of bombs and in directing gunfire"; but to argue from this that "it has established itself as an effective weapon for warfare far removed from the coast and from available bases" is something of a *non sequitur*.

However, before dealing with this point, let me quote Admiral Moffett's final claim: "Filled with helium, a non-inflammable gas found in large

quantities only in the United States, we have (in the airship) a tremendous factor in naval warfare and an agency of vital importance to national defense." All these claims, excepting that as to helium, were put forward with equal confidence by Germany before the war, and so highly was the military value of the Zeppelin rated that no less than sixty-five of them—not counting thirteen dirigibles of other types—were built for the German Navy alone between 1914-18. In addition, twenty to thirty more were built for the use of the army; so that, from beginning to end, the Zeppelin war fleet numbered not far short of 100 units.

What influence did this huge fleet of sky cruisers exert on the operations by sea and land? The answer is—Virtually none at all. As showing their value for army purposes, it may be mentioned that after the second month of the war they were forbidden to come anywhere near the fighting zone, and thereafter were only employed on raids against England. As for the naval airships, some of them remained in service to the end, by which time the most ardent Zeppelin enthusiasts were disillusioned.

Here is the official record of their naval Zeppelin losses alone and the cause thereof: By enemy action, twenty-six; bad weather, fourteen; accidental explosion, twelve; total losses, fifty-two ships. Besides these, it was found necessary to place fifteen vessels out of commission because they were defective or unsafe. By the time the armistice was declared the German Navy had only seven effective airships left. All the rest had been destroyed by enemy action or misadventure, or become too defective for further use.

This appalling wastage might have been justified had the airships rendered any war service of conspicuous value; but they did not. Weather conditions prevented their being present on the critical day of Jutland, just when they were most urgently needed by the German fleet; and for the same reason they took no part in the Dogger Bank action of January, 1915, when a single efficient air scout would have saved the German battle cruiser squadron from running into the lion's jaws.

Although Zeppelins were supposed to be continually patrolling the North Sea, they were rarely or never able to detect the British warships that entered the Heligoland Bight, time after time, to sow mines or attack the German patrols. Zeppelin scouts gave no warning of the smashing air raid against the Tondern aerodrome carried out by machines from the big airplane carrier *Furious*—a blow that cost the Germans two of their latest dirigibles, which were blown to pieces in their sheds. In fact, the Germans admit themselves that their Zeppelins failed them on every occasion when they were most needed. In the latter part of the war they were withdrawn altogether from the North Sea, owing to the regularity with which they were shot down by the British airplanes or warships.

Should Germany ever go to war again, it is certain that she will first put all her Zeppelins in dry storage and keep them out of harm's way until peace returns. She still believes in their commercial utility as passenger and mail carriers, but as engines of war they are hopelessly discredited.

What is the reason why these giant airships, which look so imposing when sailing amidst the clouds, have become practically worthless for any operation of war? Simply this—that the airplane has already reached a stage of development at which it can be relied upon to destroy the largest Zeppelin under almost any circumstances. The airplane, being at least twice as fast, can easily overhaul the dirigible and select the most favorable position for attacking it.

Contrary to what is often claimed, the Zeppelin has no advantage in "ceiling"—that is, it cannot ascend to a greater height than the latest types of plane. It follows, therefore, that once a Zeppelin has been sighted by airplanes it can be speedily overtaken, outclimbed and attacked. Nor will a

filling of helium save it from destruction. This gas, it is true, being non-flammable, cannot be ignited by the flame bullets which brought down so many Zeppelins during the war. But once let an airplane get above the Zeppelin and drop explosive bombs on its back and the monster is doomed.

More deadly even than the bomb is the non-recoil shell with which the large fighting planes of the future will be armed. Weapons of this kind, firing projectiles of twelve or fifteen pounds, have already been mounted in airplanes and excellent practice made with them. Flying parallel with or above or astern of the Zeppelin, which offers an enormous target difficult to miss, hostile airplanes can send salvos of high-explosive shell smashing through its light framework and ballonets and shoot it to pieces in no time. That is why the Zeppelin is likely to prove an absolute death-trap to those who are foolhardy enough to go cruising in it during war.

Its one possible use is in the rôle of naval scout in areas where no hostile airplanes are likely to be met with; but since a scout, to gain intelligence of any value, must needs come within view, and therefore within range, of the enemy whose movements are to be reported, the terrible vulnerability of the Zeppelin restricts its usefulness even in this limited sphere.

Finally there is the question of cost, not of the airship alone, but of the enormous sheds which it requires for docking purposes. Germany has spent twenty million dollars in building sheds and other accommodations at a single Zeppelin base, that of Nordholz, near Hamburg. Further, to maintain a fleet of Zeppelins it is necessary to create an elaborate ground organization, which besides costing a great deal of money diverts large numbers of personnel from other duties.

The more closely one studies the pros and cons of this question, the more strongly is one confirmed in the opinion that as an adjunct to navy or army the big airship is an expensive and utterly useless luxury.—Hector C. Bywater in *Baltimore Sun*, 13 April, 1923.

DIRIGIBLE DEFENDED BY ADMIRAL MOFFETT.—The advanced state of construction of the rigid airship *ZR-1* at the Naval Air Station, Lakehurst, N. J., and the fact that this huge ship, the first of its kind to be constructed in this country, will be flown during the coming summer makes timely a discussion of the relative merits of this type of aircraft.

The first question that arises may be stated briefly as: "What part will airships play in the future strategy of the sea?" This is a pertinent query in view of the fact that the experience during the last war is altogether insufficient on which to base conclusive statements, and yet, on the other hand, such experiences give in a measure an indication of future possibilities in the airship.

The merits and limitations of airships suggest at once that their function will be strategical rather than tactical—*i. e.*, that they will be used mainly for long-distance scouting and reconnaissance and as little as possible for combat. Even in the North Sea, where the comparatively small area, the prevailing cloudiness and the poor visibility render the airship's qualities of high speed, combined with great endurance, unavailable to anything like their full possibility, the Germans found their airships of great value in watching the British naval movements. The co-operation and reconnaissance of airships were of vital importance to the high seas fleet and were able to keep it fully informed, and this service is recognized with deep gratitude by Admiral Sheer.

In the battle of Jutland, ten airships were out and, although handicapped by low visibility, they were able to furnish some valuable information in the latter phases of the battle. In the sorties of the German Fleet in August, 1916, the surface ships were preceded by eight Zeppelins which guided the fleet and developed its attack.

A high British naval authority has reckoned the services of one airship as equal to that of six scout cruisers and the failure of the British to provide an adequate program of development along this line was severely criticized when the activities of the German Zeppelin fleet became increasingly evident.

A few uses which Germany found for the Zeppelin in the last war aside from bombing raids may be cited as follows:

In the works of Admiral Viscount Jellicoe, "The German Zeppelins, as their numbers increased, were of great assistance to the enemy for scouting, each one being, in favorable weather, equal to at least two light cruisers for such a purpose." And later in his execellent volume *The Grand Fleet, 1914-16*, the much reduced fleet made precipitately for home as soon at it was warned by its Zeppelin scouts of the approach of the Grand Fleet.

Admiral Jellicoe further says: "We had already had considerable experience of the value of Zeppelins to the German High Seas Fleet as scouts. That experience had fully confirmed the views put forward in 1913 on this subject at a period when, as Second Sea Lord, I had the Naval Air Service under my supervision. These views were expressed on an occasion when the building of a fleet of Zeppelins was being urged on behalf of the navy. It was then pointed out with emphasis how great would be the value of such vessels for reconnaissance duty in connection with fleet movements."

On the other hand, the lessons that were learned of rigid airships during the last war cannot be used to any great extent for a basis of plans for the future. Nor do the conditions which exist in the last war approximate those that might be anticipated in the case of an emergency for this country. Consider the Pacific Ocean as debatable territory in the future. Over the vast expanses of this body of water no other type of aircraft or surface ship can be considered even comparable to the rigid airship for ascertaining the movements of an enemy. Knowledge of these movements is a most vital factor in securing control of the sea and a successful issue of the combat between the main battle fleets.

In long-distance scouting it is seldom necessary to push home the observation against strong resistance. One would not send a light scout cruiser into the center of an enemy fleet formation. The airship is essentially a scout. It is not designed as a combat craft, and its area of greatest usefulness is not fifty or sixty miles off the coast, but 1,000 or more miles at sea. It can travel at a rate of more than double the fastest surface ship; it can sustain itself in the air for three days or more if the necessity arises and it can carry tons of supplies, stores and ammunition. If the worst comes to the worst it could put up a fight that would furnish plenty of interest for any adversary that might be sent against it.

It has been on the score of vulnerability that the airship has been most frequently attacked by military critics, and this is recognized as the most serious handicap to the airship for military and naval use. The susceptibility to fire from incendiary bullets will be the greater part eliminated by the use of helium, and even during the last war when a well-placed incendiary bullet in the hydrogen-filled gas bag of an airship was supposed to write finis on its chapter of usefulness, there are interesting instances on record where airships have been skilfully and successfully fought against attacks by airplanes.

In the case of a Zeppelin attacked by eight naval planes over England during the war we have an interesting illustration of such cases. According to the dispatches current at the time "four bombs were dropped when 300 feet above the airship. A large column of smoke was seen to come out of one of her compartments. The Zeppelin then rose to a height of 11,000 feet and is believed to be severely damaged." And in the same despatch, "All of our machines were exposed to a heavy fire from the Zeppelin." This is

scarcely conclusive as to the effectiveness of airplanes against rigids. The Zeppelin was "believed to have been severely damaged," but there was no evidence that she was destroyed in spite of a concentrated attack by eight planes, and the planes themselves had a rather warm time of it. And in another case where a Zeppelin was attacked by airplanes, "bullet now followed fast on bullet. We counted twenty-five hits, twenty-five holes through which the gas escaped, and still destruction was not effected." No, the airship most certainly is not invulnerable against attack from the air. On the other hand, neither is she at a hopeless disadvantage any more than any other types of naval craft which have their inherent weaknesses and their recognized uses.

For short-distance reconnaissance and battle purposes the heavier-than-air craft are undoubtedly more efficient and cheaper than any possible type of airship, but the comparatively small range and endurance of the airplane require some sort of carrier for its use at sea. Surface ships are generally thought of in connection with airplane carriers, but the airship is also susceptible of development as a carrier of heavier-than-air craft, and in this manner she may provide herself with an altogether adequate defense against attack from enemy planes. Even before helium was seriously considered the British had planned on placing a fairly heavy armament of rapid-fire guns on several airships. And today this is counted as much a part of the defensive armament of the airship as are 16-inch guns a part of the armament of the battleships. Were we to dwell upon the vulnerability of the airship to the exclusion of the manifold other sides of the question, there is scarcely a doubt that development along this line would cease and in extension of this we might just as logically dwell on the terrible havoc wrought by the machine gun against infantry, the frightful toll taken by gas attack, or the potential destruction of a 16-inch gun. In the strategy of warfare the advantage has always fluctuated with the progress of science and invention, swinging first to one side and then to the other as developments have been brought forth as answers to the latest menace.

If we go back again to the experience gained in the last war we find that "of the Zeppelins destroyed or damaged by gunfire, the majority of the losses were on bombing raids prior to 1918, and in practically all cases the damage was done while flying at low altitudes—9,000 feet or under." And the bombing raid over land was not a logical use for the naval air scout. It was only so used because its normal field of usefulness was restricted by the nature of the operations. On the other hand, only three cases can be found of fatal enemy damage to a rigid while operating with the fleet.

Let us turn to the project of long-distance flights by rigids and taking extreme tests—voyages to the poles and around the world—examine into their feasibility and practicability. Shortly after the announcement that in connection with the development of rigid airships in this country such flights would be incidental to the test of the ships, a letter from the distinguished Arctic explorer Vilhjalmur Stefansson, was received and may be quoted in part as follows: "Some time ago I announced my permanent retirement from polar exploration, giving as one of my reasons that I considered transpolar air commerce so near that special exploring efforts are not required. The polar regions will be opened as a mere incident to the development of commerce. In view of your announcement, I have thought it possible you might be particularly interested in the subject of a recent book of mine, *The Northward Course of Empire*. One chapter in it is devoted to transpolar air commerce, and there is a map at the end illustrating this."

As for the matter of a flight around the world, if the impression has been given that this could be undertaken as a non-stop flight this is an excellent opportunity to correct it. Those who are familiar with the

endurance of modern airships cannot have gained such an impression, and for the benefit of those who have not followed airship development so closely it may be said that such a project is at the present time impossible and has never been contemplated. But the matter of circumnavigating the earth by airship with appropriate stops for refueling is an altogether reasonable and feasible proposition. To support this statement we may draw upon the experience of the German Zeppelin *L-59* which in 1917 made a non-stop flight from Bulgaria across the Mediterranean and Egypt to Lake Victoria Nyanza, and was then recalled to Jamboli, Bulgaria, without having landed. This voyage covered 4,500 miles without benefit of meterological service, and over unexplored and enemy region. It may be added that the ship returned to Jamboli with fuel for forty-eight hours cruising, which represents almost 3,000 miles additional cruising radius. This voyage, of course, eclipsed that of the English ship *R-34*, which made the round trip across the Atlantic Ocean shortly after the end of the war.

The matter of long-distance and endurance flights is inevitably linked with the strategical value of the airship as an instrument of war, and such tests would be of incalculable value. It may be added, however, that they would only be undertaken with the same degree of preparation and careful planning that insured success to the first transatlantic passage by air of the *NC-4* in 1919, which was carried out by the United States Navy.

If further justification be needed for the development of rigid airships in this country beyond that of national security it can be found in the commercial possibilities which may come to be recognized generally of late years, both in this country and abroad. One of the reasons for developing airships which has actuated the Navy Department in this project has been this commercial possibility, and the advantages that will accrue to American commerce and industry through their development.

The Navy has in many ways in the past been able to point the way to progress in peace as well as do its full duty in war. Many of the maritime developments which serve the interests of commerce today had their origin in naval construction and engineering, and in the development of airship construction and operation a further field of usefulness is opened up in which the navy may pioneer to the lasting benefit of the country.—Rear Admiral W. A. Moffett, in the *Baltimore Sun*, 16, 17 April, 1923.

CURRENT NOTES AND PROFESSIONAL PAPERS

"Electrons, Atoms, and the Ether."—(An outline of the present knowledge of the subject resulting from recent investigations.)—By W. B. Cartmel in *The Engineering Journal*, April, 1923.

"The Design and War Service of Coastal Motor Boats."—(Abstract of paper read before the Institution of Naval Architects.)—By Sir J. E. Thornycroft, in *The Engineer*, 30 March, 1923.

"New Type of Flying Machine—the Lacierva 'Autogiro.'"—(A brief description of the new Spanish machine which lands with practically no forward speed.)—By Heractio Alforo in *Aviation*, 9 April, 1923.

Pertinent articles in:

Engineering for 23 March, 1923:

(1) "A Proposed Aircraft Carrying Mail Steamer."
(2) "The Air Estimates."
(3) "The Institution of Naval Architects."
(4) Remarks on Some of the Present-Day Problems in the Design of Ships." (Illus.)
(5) "First Report of the Steam-Nozzles Research Committee."

The Engineer for 6 April, 1923:

(1) "The Development of Naval High-power Valves."
(2) "Electric Ship Propulsion."
(3) "Conversion of Warships to Mercantile Use."

Aviation for 2 April, 1923:

(1) "The Wright All-Metal Pursuit Plane."
(2) "Characteristics of U. S. Naval Airship *Z R 3*."
(3) "Proposed Type of Rigid Airship for Civil and Military Purposes and Airship Depot Ship." (Illus.)
(4) "Experiments in Contact Flying."

Army Ordnance for March-April, 1923:

(1) "Tendencies in Ammunition Design," by J. K. Crain.
(2) "Sympathetic Detonation," by C. G. Storm.
(3) "Dyes and National Defense," by C. K. Weston.
(4) Gun Recoil and Recoil Systems," by Lieutenant Commander A. G. Zimmerman, U. S. N.

The Coast Artillery Journal for April, 1923:

(1) "Doctrine and Command," by Brigadier General R. P. Davis, U. S. A.
(2) "Our Military Policy Regarding the Training of Citizens," by Major E. W. Thomson, C. A. R. C.

Current History for April, 1923:

(1) "The Case for the Naval Treaty," by Rear Admiral W. V. Pratt, U. S. N.
(2) "Germany's Ability to Pay," by J. Ellis Barker.
(3) "President Harding's Plea for the World Court."
(4) "Rival Foreign Policies in Great Britain."—Editorial.
(5) "Monarchist Sentiment in Germany," by Sarah Wambaugh.

The Fortnightly Review for March, 1923:

(1) "Some American Naval Views," by W. H. Gardner. (Vice-president, Navy League, N. S.)
(2) "The New German Merchant Fleet and Others," by Archibald Hurd.

NOTES ON INTERNATIONAL AFFAIRS

FROM MARCH 23 TO APRIL 23

PREPARED BY

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UNITED STATES

LANSING-ISHII AGREEMENT CANCELLED.—On April 15 notes were exchanged between the United States and Japanese governments formally confirming the cancellation of the Lansing-Ishii Agreement of 1917. This agreement recognized special interests of Japan in China, especially in Chinese territory contiguous to that of Japan. It was set aside, however, by the treaties negotiated at the Washington Conference, a result which the present exchange of notes merely confirms.

The Root-Takahira Agreement of 1908, still in effect, pledges both nations to maintain the *status quo* in the Pacific, equal rights for all nations in China, and Chinese independence and territorial integrity.

RHINE ARMY COSTS STILL UNSETTLED.—At the close of April the negotiations in Paris over settlement of the American Rhine Army claims were still unfinished. It was agreed that the $240,000,000 due should be settled in twelve annual payments, but a final hitch arose over American insistence that these payments should be given priority over payments in funds or in kind to the European allies.

UNITED STATES AND WORLD COURT.—According to a press report of April 19 from Geneva, Miniechiro Adachi, Japanese Minsiter to Belgium, who is official reporter for the Permanent Court of International Justice, and Professor Manly C. Hudson of the Harvard Law School, were at work on the details of a plan by which the United States might become a member of the court on the terms stipulated by Secretary Hughes.

In spite of widespread criticism, President Harding in speeches and interviews adhered to his advocacy of American participation in the court. Speaking at Des Moines on April 21, Secretary Hoover also defended his policy. He declared that the chief objection was the connection of the court with the League of Nations but pointed out that, although created by the League, the court really functioned under a treaty among the

powers that had submitted to the court's jurisdiction. He added that the President's proposal did not involve submission to compulsory jurisdiction.

The "statute" of the Court provides that it may handle disputes about treaties, breaches of international obligations and reparations for such breaches, provided such disputes are submitted to it by both parties. There is also an optional clause attached to the statute, which if accepted by a nation thereby pledges that nation to compulsory jurisdiction of the Court in certain legal disputes with other nations, who also have accepted the optional clause. Eighteen nations have adopted this optional clause—although Great Britain, France, Italy and Japan are not among them. (The President's proposal for our participation in the Court does not call for adherence to the optional clause). —*Time,* April 21.

LATIN AMERICA

ARMAMENT DISCUSSION AT SANTIAGO.—The limitation of armaments negotiations at the Pan-American Conference in Santiago seem to be on the point of breaking down, owing to the hostilities of Argentina. The Expounding Secretary, Antonio Huneus, Chili, brought forward the recommendations of the Armaments Committee which provide: that the question of the limitation of armaments of South America be solved through separate negotiations between the interested nations; that the Governments declare their desire for immutable peace and against armed peace; that they adhere to the Washington naval treaties, fixing the tonnage of capital ships and establishing immunity for neutral merchant ships from submarine attack; that they adhere to the various international conventions tending to prevent and humanize war.

Brazil accepted the recommendations in principle, but Argentina said that the report did not in all respects meet with her views, and intimated that she would have something more to say at a later date.—*Time,* April 21.

DEADLOCK IN THE RUHR

INDIRECT GERMAN PROPOSALS.—In a speech in the Reichstag on April 26, Foreign Minister von Rosenberg of the Cuno Cabinet made statements which were interpreted as indicating the terms which Germany was willing to offer for a settlement in the Ruhr. Baron von Rosenberg stated that last January Germany was prepared to offer twenty billion marks, plus such sum as might be judged reasonable by an international commission, and he thought this might serve as "a point of departure" for renewed discussions. He added that Germany was favorable at all times to the Hughes plan of settling the reparations question by a neutral commission, but that the system of passive resistance in the Ruhr would be continued indefinitely if necessary.

On the same date it was announced in Paris that exports of coke from the Ruhr to France and Belgium had reached 10,000 tons a day, plus 3,000 tons of coal, a figure which it was said would cover the expenses of the Ruhr occupation.

Speaking in the House of Commons on April 21 Lord Curzon indicated that Great Britain contemplated no immediate change from her policy of "hands off," but had suggested to Germany that she make renewed approaches to France.

At Dunkirk on April 15 Premier Poincaré definitely denied any intention of annexation on the part of France, but repeated the fixed intention of the French Government to hold the occupied territory until a settlement was made. He said in part:

"The guarantees which Germany did not wish to give us and which certain of our Allies in good faith thought useless we considered necessary. What we have seen in the Ruhr has convinced us we were right.

"We hold these guarantees now: we hold them solidly, and we shall not give them up for mere promises. We will quit the occupied regions only as we are paid what is due us. Be sure that in affirming her will and in proclaiming to the world that she intends to enforce the peace Treaty France has not lowered herself in the esteem of the peoples of the world. She is grander in the eyes of all those who respect right, and those friends of ours in England and America who differed with us on the advisability of our action have been obliged to approve our motives and the legitimacy of our claims.

"The change of opinion in our favor in the United States and throughout the British Empire is certainly due in great part to the fact that we knew enough to put our hand on what Mr. Bonar Law calls the jugular vein of Germany. We do not wish to strangle anyone. We have no other ambition than to be paid and protect ourselves from financial disaster.

"The accusations of imperialism which German propaganda has been able to provoke against France in quarters too easily accessible to it are only foolish and childish. No sensible person can believe that France, which has always furthered the rights of mankind and given the fullest expression to national sovereignty, has the foolish thought of submitting foreign populations to her authority and grabbing territories against the wish of their inhabitants."

LOUCHEUR'S VISIT TO ENGLAND.—During the first week of April former Minister Loucheur, a leader of the Moderate party in France, visited England to sound out the British attitude toward a renewed Franco-British understanding. His journey was entirely without official sanction from the Poincaré Government. M. Loucheur stated on his return that he found sentiment in England swinging strongly toward France, and that he intended to bring pressure on M. Poincaré to make immediate moves toward a concerted policy with England.

NEAR EAST

ALLIED REPLY TO TURKEY.—At the close of March, following a conference in London, France, Italy, and Great Britain agreed upon a reply to Turkey consenting to a renewal of negotiations at Lausanne on April 23. The reply rejected the Turkish request for separate consideration of the economic clauses of the treaty, and also the request for further modification of the judicial clauses affecting foreigners. It was agreed that the question of indemnities growing out of the Turco-Greek war might be adjudged by a neutral commission. Soviet Russia is not allowed representation at the conference.

TURKISH CONCESSIONS TO ADMIRAL CHESTER.—Early in April it was announced that the Angora Government had granted extensive railway and

mining concessions, not only in Turkish territory proper but extending into the British mandate of Iraq, to the Turkish-American Development Company represented by Admiral Colby M. Chester. The concessions included railways in eastern Asia Minor running from Sivas to Angora, Samsun, Erzerum, and Van, with oil and mining rights for twenty kilometers on either side of the railways, and also grants for construction of ports, roads, canals, telegraph lines, factories, etc. The railway concessions included a line from Harput to Sulemania within the Mosul region claimed by Great Britain. In view of their extraordinarily comprehensive character the Turkish grants were regarded abroad as primarily a political move to involve the United States more directly in the negotiations at Lausanne.

The French Government protested to Turkey that the Chester concessons constituted "an unfriendly act," in conflict with French concessions based on a loan to France in April of 1914 and in conflict also with the agreement negotiated in 1921 between France and the Kemalists.

To a French note on the subject the American State Department replied that, while the United States Government intended to support all legitimate American claims, time was required to examine more fully the status of the Chester concessions before action could be taken.

RED CROSS ENDS EMERGENCY RELIEF.—On April 2 the American State Department issued notice to the Allied Powers that American Red Cross Emergency Relief for adult refugees in the Near East would be ended on June 30. According to the note, the organization for five months had provided for approximately 868,000 refugees in Greece and islands of the eastern Mediterranean. The note requested that Great Britain, France, and Italy direct attention to the problem, and stated that if a constructive plan could be worked out for an apportionment of the task and its gradual solution, American relief agencies would be ready to co-operate even after termination of emergency relief on June 30.

GREAT BRITAIN AND IRELAND

LAW CABINET THREATENED.—On April 10 the Bonar Law Government in England suffered an unexpected defeat in the House of Commons over a minor question, the investigation of grievances of ex-service men. Later Mr. Bonar Law issued an official statement that the Cabinet had no intention of resigning. Discussion of the reverse centered chiefly on the weakness of the present Conservative Ministry, especially in view of the Premier's ill health and inability to speak in the House, and the possibility of a new government based on the center party idea, with ex-coalition ministers included and Mr. Austen Chamberlain at the head. This, it was held, would be the only alternative to ultimate control of the government by the Labor party.

BRITISH BUDGET STATEMENT.—The first budget of Chancellor of the Exchequer Stanley Baldwin was presented to the House of Commons on April 16. It stated that the Treasury had a surplus last year of about £100,000,000; that the estimated taxes and expenditures for the coming year promised a favorable balance of about £36,000,000; and that in view of these circumstances it would be possible to reduce slightly the income and profits taxes and cut the beer tax a penny a pint. The report stated that financial conditions were showing steady improvement.

REBEL IRISH LEADERS CAPTURED.—On April 10, Liam Lynch, Chief of Staff of the irregular Irish forces, was captured by Free State Troops and later died of wounds. Eammon de Valera and other rebel leaders narrowly escaped. It was calculated that there were about 10,000 irregulars in Free State jails and internment camps, and that resistance was practically broken.

RUSSIA

CHRISTIAN PRELATES PUT TO DEATH.—Archbishop Zipliak, head of the Roman Catholic Church in Russia, and Vicar General Butchkavitsch, were condemned to death in Moscow on March 26 on charges of treacherous opposition to the Soviet Government. The Vicar General was put to death five days later by being shot in the back of the head.

The execution took place in spite of the protests of European powers, the United States, and the Pope. M. Tchitcherin replied to the protests in sharp notes referring to them as "unfriendly acts" and manifestations of an aggressive policy against Russia. He asserted the undeniable right of Russia to punish criminals according to her laws.

The trial of Patriarch Tikhon, head of the Greek Catholic Church, on similar charges, was set for April 10 but later postponed to April 24. According to a Soviet bulletin the Patriarch confessed to treasonable connection with the Kolchak and Wrangel counter-revolutionary movements.

REVIEW OF BOOKS

WITH THE RUSSIAN ARMY, 1914-1917, (2 Vols.), Major General Sir Alfred Knox, K. C. B., C. M. G. E. P. Dutton and Company, New York. 760 pp. $15.

A Review by Colonel W. K. Naylor, G. S. U. S. Army

A work in two volumes which was prepared chiefly from the diary of the author, filled in and made complete by a narrative, data for which was obtained by personal observations and deductions, and from that of others. The work is freely illustrated by photographs of individuals, of groups of individuals, and of scenes in the theater of war. In addition, there are nineteen maps accompanying the work, drawn with sufficient detail to enable the reader to keep himself oriented geographically.

In a study of the World War from the viewpoint of operations on the Eastern Front, the question always arises in the mind of the student as to what was the matter with the Russian Army and why was it that Russia with her wonderful resources both in men and material crumbled before the armies of the Central Powers and completely went to pieces, the government changing itself from that of autocracy, through various vicissitudes, to its present form, whatever may be the most appropriate name for it. General Knox in the early part of his work, points out in a very lucid manner wherein the shortcomings of the army lay and later on wherein the government so completely failed. Upon entering this war, Russia had expected that it would be short, for all of her previous wars of recent centuries have been rather short as compared with the World War, and she was prepared to meet the emergencies of a short war; but when the operations extended themselves into years instead of months, the Russian authorities found that they had not so marshalled the resources of their country that they could keep up the uninterrupted flow of supplies of munitions and food from rear to front so necessary to insure success. In her dilemma, Russia called upon her allies for assistance but when that assistance came, she found that she was unable to take full advantage of it due to the fact that her railroad system and system of dirt roads were so inferior as to break down and become swamped with the ever-increasing demands made upon them.

A study of the Russian situation makes it only too apparent that provision must be made in time of peace for industrial mobilization, and while it is equally, if not more, important to make provision for the mobilization of man-power, that man-power once mobilized becomes impotent unless it can be supplied with modern instruments of war. Russia also discovered

that she had made no provision for a reserve of officers to meet the drain upon that corps made by active service. The Russian soldier normally is a good fighter so long as he has officers to lead him. To quote from the text, "The Russian soldier requires leading more than any soldier in the world, and the lack of officers and non-commissioned officers of quality was felt throughout the war." This quotation should be kept in mind, particularly in this country, by those who may think that building up a reserve officers' corps is entirely unnecessary. While the American soldier has always had great individuality, it must be borne in mind continually that no matter how able and intelligent individuals may be, they quickly degenerate into an uncontrollable mob without leaders. The difficulties of Russia in regard to supply are quite vividly shown in the following paragraph taken from the author's introduction:

> A very few weeks of war proved to all the combatants that their initial stocks of shell and materials of war generally were insufficient to insure a decision. Germany, France and England diverted their thousands of factories to war-work. But Russia, with her 180 million inhabitants, had roughly only one factory to Great Britain's 150. She had not the machinery or the tools or the trained personnel. Machinery and tools could only be obtained from America, where the Allies had already swamped the market. Even if shipped from America there remained the difficulty of their delivery at industrial centers in Russia.

The author, himself, could see that Russia was steadily tending toward revolution. On September 19, 1915, he reported: "If there has ever been a government that richly deserved a revolution, it is the present one in Russia. If it escapes, it will only be because the members of the Duma are too patriotic to agitate in this time of crisis." It is a generally accepted legend that Russia was sold out to Germany by members of her official military and governmental service. After reading the text, one is impressed with the fact that the downfall of the Russian Army was due to the defective supply systems and general corruptness and incompetence in the staff and higher up; not a leaning toward Germany but a corruption born of selfishness and a desire on the part of offenders to benefit by the transactions in which they were taking part.

The railroad system completely failed, due in a great part to the fact that the railroads were turned over to the military for control and operation instead of merely direction. A glance at the map shows the great advantage that Germany had over Russia with her Rocade lines paralleling her border and that of her ally. Germany and Austria could concentrate almost anywhere before Russia. The Central Powers had the additional advantage of a re-entrant frontier which made it possible for them to strike their enemy from two directions simultaneously.

There were many brilliant feats of strategy and tactics carried out by the Russian Army. As an illustration, the counter-offensive in October-December, 1914, which drove the Germans back from Warsaw is the most outstanding. Before this, however, we have Samsanov's defeat at Tannen-

burg which was brought about by a premature advance of the army of the Narev before mobilization and concentration had been completed.

There are many things brought out in the text that show the weakness of the Russian Army. For example, poor communications as already mentioned; no arrangements made for replacements except in certain select organizations; the shortage of ammunition supply; failure to conserve rifles; failure to entrench; failure of Russian cavalry to pursue after a success and its lack of understanding of the advantages and use of dismounted fire action; defective intelligence arrangements; often no systematic patrolling of the front; relying upon local purchases for supply rather than an efficient supply system, etc. Many of these defects were existent in the Japanese War but had not been corrected.

The text, from time to time, gives short biographies of leading Russian generals which bring out many strong characters, nevertheless I believe that the real hero of the war on all sides, Russia in particular, is disclosed by the following extract from the text: "I wonder when people will realize that the real hero of the war is the plain infantry private or second lieutenant."

The author gives a very clear description of the conditions preceding the revolution; a description of the revolution and the coming of Kerenski and later the Bolshevik Coup D'Etat. Both Kornilov and Kerenski ran true to form following historical precedent; that is, Kornilov was severe without the ability to enforce his will entirely, and Kerenski was weak when he should have been strong. The revolution started as a bloodless affair that might have been handled and kept within bounds had the right man or group of men appeared upon the scene. The discipline in the Russian Army was not nearly as severe as that in the armies of the allies, showing that the Russian soldier was easily amenable to reason and to argument. In one case the author refers to the mutiny of a regiment in Petrograd, and the officers were not enough concerned with it to forego their evening's bridge game. When discipline is gone in the army, so is everything. Even Kerenski realized this for he stated in a communication of May 25, 1917: "Without discipline there can be no safety."

The final offensive that came to such an inglorious end had at least one bright feature, and that was the heroic action of the officers in actual command of the troops. They did not hesitate to risk their lives when the occasion called for it, and many died in a most gallant manner vainly endeavoring to lead their troops forward. Their actions will stand out as a bright star of which all Slavs may justly be proud when, in after years, they contemplate the desert of darkness surrounding their motherland of this epoch. Taking General Knox's contribution to history by and large, I believe every student of the World War should read it, and I personally have found that after a careful review I have a fuller picture of conditions on the Eastern Front and in Russia and fully believe that had the Russian soldier been given any kind of a chance, the story would have been different.

JANE'S FIGHTING SHIPS, 1922. Edited by Oscar Parkes, O.B.E., M.B., Ch.B. Sampson Low, Marston and Company, Ltd. London. 426 pages.

A REVIEW BY COMMANDER H. G. S. WALLACE, U. S. NAVY

For many years, *Jane's Fighting Ships* has been the standard work of reference on the navies of the world, and has been of great value, not only to those who are interested in warships from an academic point of view, but to naval men the world over.

The *1922 Jane* is well up to the standard of previous editions. Edited by Mr. Oscar Parkes, one of the joint editors of the preceding edition, it carries out, in the main, the same general plan as that heretofore employed, but with an even greater amount of detailed information, and with improvements in several features.

Among the improvements to be noted are the increased number of excellent photographs, many of them on quite a large scale, the addition of a number of aircraft views of ships, the increased size and clearness of the silhouettes, the greater amount of detailed information regarding the battleships to be retained under the Limitation of Armament Treaty, and a considerable amount of information regarding the new and projected aircraft carriers. The volume is somewhat smaller than preceding editions, due to the omission of harbor charts, and the elimination of individual photographs of some of the relatively unimportant auxiliary and supply vessels. There have also been omitted entirely those ships formerly projected, or in course of construction, but which, under the treaty, are not likely ever to be completed.

Altogether, the *1922 Jane* reflects great credit on its publishers, and is an essential addition to every naval library.

SECRETARY'S NOTES

Obituary Notice

The Secretary regrets to announce the death, on 3 May, 1923, of Mr. James W. Conroy, for thirty-seven years connected with the Naval Institute. By his high sense of responsibility, devotion to duty, and painstaking efforts in behalf of the Institute, he has effectively assisted in its growth. By his unfailing courtesy and spirit of co-operation he has won the friendship of all who knew him, Personally known and highly regorded by thousands of members of the Institute, from admiral to ensign, his loss will be regretted by all.

Awards in Prize Contest Handling Personnel

The Prize Contest for the best "Outline Plan of a Textbook for Midshipmen on HANDLING PERSONNEL" met with a gratifying response. Twenty-one articles were submitted, and much valuable material was received.

Prizes hae been awarded as follows:

First prize, $200, Lieut. Comdr. P. V. H. Weems, U. S. N.

Second prize, $150, Lieut. Comdr. Fitzhugh Green, U. S. N.

Third prize, $100, Lieut. Comdrs. E. G. Small and M. S. Tisdale, U. S. N.

Fourth prize, $75, Lieut. A. G. Shepard, U. S. N.

Fifth prize, $50, Captain W. T. Cluverius, U. S. N.

Sixth prize, $25, Comdr. C. B. Mayo, U. S. N.

Seventh prize, $25, Colonel G. C. Thorps, U. S. M. C.

Change in Board of Control

Captain John Halligan, Jr., U. S. Navy, tendered his resignation as a member of the Board of Control, due to detachment from duty at the Academy. His resignation was accepted with regret by the Board.

Dues

Members who have not yet paid their dues for 1923 are urged to do so promptly. The amount of outstanding dues is in excess of $10,000, which is a heavy drain upon the Institute's resources. The interest alone upon this sum is about $500 per year.

Subscription Rates In order to bring the subscription rate more nearly in line with the cost of publication, the Board of Control has increased the subscription rate to $5.00 per year. A special rate of $3.50 per year is made to members only (not available to societies or organizations) in order that they may send subscriptions for the PROCEEDINGS to their relatives and friends. (Foreign postage 50 cents extra in all cases). Subscriptions are automatically discontinued at expiration.

Articles The Institute desires articles of interest to all branches of the service, including the reserve force. Non-members as well as members may submit articles, and authors receive due compensation for articles published. Compact, well digested articles are more likely to be accepted for early publication. In accepting articles for publication, the Institute reserves the right to have such articles revised or rearranged, where necessary, in order to bring them up to the required standard of articles published in the PROCEEDINGS—the cost, if any, to be deducted from the compensation due the author.

Reprints of Articles Twenty copies of reprints are furnished authors free of charge. Additional copies to the number desired will be furnished at author's expense, provided request is made before going to press.

Discussions Discussion of articles published in the PROCEEDINGS is cordially invited. Discussions accepted for publication are paid for at approximately one-half the rate for original articles.

Book Reviews As soon as practicable after the publication of books on subjects of professional interest, the Institute aims to publish authoritative reviews of them.

Address of Members To insure the delivery of the PROCEEDINGS and other communications from the U. S. Naval Institute, it is essential that members and subscribers *notify the Secretary and Treasurer of every change of address without delay.* No responsibility can be accepted for failure to receive the PROCEEDINGS, where members fail to comply with this rule.

H. G. S. WALLACE,
Commander, U. S. Navy, Secretary and Treasurer.